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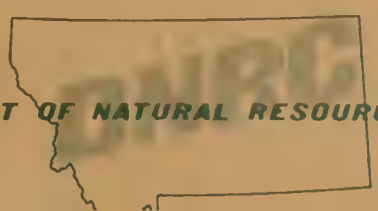

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MONTANA LEGACY PROGRAM

BACKGROUND

For the past few years the interest income from the Resource Indemnity Trust fund (RIT) has been used to support the daily operations of several Montana natural resource agencies. The 1983 Legislature directed that the funds should no longer be used for these purposes and called for a program that would allow the funds to be used instead for specific projects throughout Montana. In response to these directives, an executive committee worked with several interim legislative committees to decide on the type of program that would meet the intention of the legislative directive. The meetings resulted in a proposal to establish the Montana Legacy Program.

The purpose of the proposed legacy program is to provide grant funds to projects that would repair, reclaim, or mitigate environmental damage from past or future resource extraction (when those responsible cannot be identified), and projects that would develop Montana's renewable resources to ensure their quality. The program would fund projects that would promote natural-resource-based economic development, protect existing natural resources through conservation, and protect Montana's environment through research that assesses damage from natural resource development. The authors of the proposal also specify a preferential consideration for projects dealing with reclamation.

ELIGIBLE APPLICANTS

Those entities proposed to be eligible for the legacy grants are any department, agency, board, commission, or other division of state government as well as any city, county, or other political subdivision or local government body of the state.

FUNDING

The funding source for the proposed legacy program would be the interest income from the RIT. This RIT, established by Montana Code Annotated (MCA) 17-2-102, receives proceeds from taxes levied on mineral production. The purpose of the tax is to provide security against loss or damage to Montana's environment from the extraction of non-renewable natural resources (e.g., oil, gas, hard minerals, and coal). Until the RIT reaches $100 million, which is estimated to be in ten years, only the interest income may be spent as appropriated by the Montana Legislature. MCA 15-38-202 allocates 30 percent of that interest income to the Water Development Program of the Department of Natural Resources and Conservation (DNRC), and, until 1989, allocates six percent to the Department of Health and Environmental Sciences for implementation of the Montana Hazardous Waste Act and the Superfund Program. As proposed, the legacy program will be funded by the remaining 64 percent (70 percent after 1989) of the interest income. It is projected this 64 percent will provide approximately $8,350,000 during the 1986-1987 biennium. Within the legacy program, an emergency contingency fund would be established, using up to ten percent of money allocated to the legacy program.

PROJECT GUIDELINES

Besides supporting the establishment of the Montana Legacy Program, the governor directed DNRC to solicit legacy grant applications. In this way, if the legacy program is established by the legislature, specific projects can be approved by the 1985 legislature and would receive funding during the 1986-1987 biennium.

To be considered eligible for the legacy program, a proposed project had to fit within at least one of the following categories:

1. Provides mined land reclamation where no party is liable for reclamation and the federal abandoned mined land fund is not available,

2. Provides reclamation for past oil and gas extraction, exploration, and processing where no responsible party can be identified,

3. Provides for reforestation of areas damaged by mining or smelting activities for which a liable party cannot be identified,

4. Provides recreational areas or natural areas to compensate for loss or anticipated loss of recreation or natural areas because of resource extraction,

5. Provides for mitigation of social and economic impacts of natural resource development that is consistent with, but not covered by, other statutes,

6. Provides for research, demonstration, and technical assistance to promote the wise use of Montana's natural resources and to make processing environmentally compatible,

7. Protects the state's renewable resources through sound soil and water conservation, weed control, and other restoration programs,

8. Provides for research to assess past or potential environmental damage resulting from natural resource development, and

9. Provides investigation and remediation of sites where hazardous and toxic wastes threaten the environment and where funding, from either responsible parties or the Comprehensive Environmental Response Compensation and Liability Act, is unavailable.

DNRC handed the responsibility for developing the proposed legacy program and soliciting applications for grants to the Water Development Bureau. This bureau presently administers two other grant programs--the Water Development Program and the Renewable Resources Development Program.

PROGRAM INFORMATION

An application form, modeled after a condensed version of the form used for the Water Development Program, was created for the legacy program. The form and a memorandum describing the proposed program were sent in September 1984 to all Montana communities, counties, universities and colleges, appropriate special districts such as conservation districts, appropriate state agencies, and all state legislators. Meetings were held with state agency personnel to explain the program and to solicit applications. An extensive public relations effort was made to inform Montanans about the program. News releases were sent to newspapers, and announcements about the program were taped for radio stations state-wide. The deadline for submitting the applications was November 1, 1984. The Water Development Bureau received 110 applications requesting over $29 million in grant funds.

APPLICATION REVIEW AND RANKING

The grant applications were reviewed for technical and financial feasibility, the public benefits to be provided, need and urgency, and the projects' impacts on the environment. Reviewers included the Water Development Bureau staff along with federal and state agency and university personnel with expertise in specific project areas. A descriptive project summary was written for each application, incorporating the concerns, ideas, and comments of the project reviewers.

For each project application, the reviewers made ranking and funding recommendations, contingent on specific requirements and restrictions set for each project. (These contingencies were needed because time constraints affecting both the applicants and the reviewers did not allow all technical and financial questions and concerns to be fully addressed.)

PROGRAM POLICIES

DNRC also proposed a set of program policies governing project applicability, contingencies, and approval of project funding. These proposed legacy policies follow.

1. A blanket contingency was established for all projects, to be included in recommendations and appropriations bill. That language is, "A grant of up to $_____ is recommended contingent on DNRC approval of the project scope of work and budget."

2. A contingency was established for all projects requiring other funding participants. That language is, "A grant of up to $_____ is recommended contingent on DNRC approval of the project scope and budget and documented commitment of other funding sources."

3. A contingency was established for all reclamation projects where the responsible party might be identified. That language is, "Funding is contingent on evidence that a liable party cannot reasonably be held responsible."

RECOMMENDATIONS

Upon completion of the project ranking and funding recommendations, the Water Development Bureau staff made its recommendations to the DNRC director. In turn, the director presented recommendations to the seven members of the newly appointed Montana Legacy Program Advisory Council. The council made its recommendations, and the proposals were submitted by DNRC to the governor.

Based on actions by the executive branch, two bills have been introduced to the 1985 Montana Legislature regarding the Montana Legacy Program. One bill will cover the legislation enabling the establishment of the legacy program, and the other will be an appropriations bill for funding the specific project applications, and establishing the emergency fund.

*Includes approval of contingencies recommended by DNRC staff (see individual project summaries for a description of these contingencies).

RANKING AND FUNDING RECOMMENDATIONS MADE
TO THE 1985 LEGISLATURE

APPLICANT/PROJECT	GRANT AMOUNT RECOMMENDED*
1. MONTANA DEPARTMENT OF AGRICULTURE Weed Control Trust Fund	$1,000,000
2. MONTANA STATE UNIVERSITY, DEPARTMENT OF BIOLOGY Stream Restoration from Placer Mining on Grasshopper Creek	58,266
3. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Bannack Apex Mill Rehabilitation	227,370
4. MONTANA BUREAU OF MINES AND GEOLOGY Field and Office Programs--Ground Water Information Center	257,300
5. ANACONDA-DEER LODGE COUNTY, DEER LODGE VALLEY CONSERVATION DISTRICT, HEADWATERS RESOURCE CONSERVATION AND DEVELOPMENT AREA Anaconda Soil Stabilization and Erosion Control	300,436
6. MONTANA STATE UNIVERSITY, DEPARTMENT OF BIOLOGY Stream Restoration--Confederate Gulch and Deep Creek	151,752
7. MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES Hazardous Waste Management Collection and Transfer Project	800,000
8. GOVERNMENT OF BUTTE-SILVER BOW Butte Hill Mining Reclamation	545,000
9. TOOLE COUNTY North Toole County Reclamation Project	390,000
10. MONTANA GOVERNOR'S OFFICE Clark Fork River Projects	100,000

APPLICANT/PROJECT	GRANT AMOUNT RECOMMENDED*
11. DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION, CONSERVATION DISTRICTS DIVISION Reclamation of Streambanks and Adjacent Areas Damaged by Placer Mining	50,000
12. MILE HIGH CONSERVATION DISTRICT Reclamation Techniques for Heavy Metal Contaminated Agricultural Lands	88,400
13. MONTANA GOVERNOR'S OFFICE Cabin Creek Reference to the International Joint Commission	80,000
14. MONTANA STATE UNIVERSITY, WATER RESOURCES RESEARCH CENTER Environmental Fate of Cyanides and Heavy Metals from Historic Cyanide Leach Operations in the Judith Mountains	20,000
15. RED LODGE, CITY OF Coal Miner's Memorial Park Revegetation and Irrigation Project	241,930
16. MONTANA STATE UNIVERSITY, 49TH PARALLEL INSTITUTE Montana/Alberta Milk River Joint Impoundment Assessment	91,104
17. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Improvements for Historic Ghost Town of Elkhorn	5,000
18. MONTANA STATE UNIVERSITY, WATER RESOURCES RESEARCH CENTER Heavy Metal Contamination In the Clark Fork River Flood Plain and Impacts on the Biotic Resources of the River	91,590
19. FORT PECK TRIBAL COUNCIL Determine Extent of Ground Water Contamination in the East Poplar Oil Field	149,542
20. POWDER RIVER CONSERVATION DISTRICT Powder River Irrigation Water Quality Study	80,000
21. TETON COUNTY CONSERVATION DISTRICT Upper Teton Water Conservation Study	212,660
22. MONTANA STATE UNIVERSITY, WATER RESOURCES RESEARCH CENTER Chemistry Controlling Copper Availability and Transportation in the Upper Clark Fork River	24,834

APPLICANT/PROJECT	GRANT AMOUNT RECOMMENDED*
23. MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES Forest Land Watershed Improvement Program	55,000
24. MONTANA STATE LIBRARY Natural Resources Information System; Natural Heritage Program	472,639
25. BITTERROOT CONSERVATION DISTRICT Demonstration of Savory Grazing Management for Weed Control	5,000
26. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Gartside Dam Repair	450,811
27. UNIVERSITY OF MONTANA Mitigation of Impacts of Natural Resource Development to the Montana Beekeeping Industry	61,482
28. TRIANGLE CONSERVATION DISTRICT Expanded State Salinity Program	150,000
29. DEER LODGE AND SILVER BOW COUNTIES Land Acquisition for Public Recreation at Georgetown Lake	580,000
30. MONTANA STATE UNIVERSITY, RECLAMATION RESEARCH UNIT Reclaiming Bentonite Mined Areas in Montana	65,920
31. MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION, CONSERVATION DISTRICTS DIVISION Soil Survey and Mapping Project	555,000
32. WHITEFISH COUNTY WATER DISTRICT Whitefish River Cleanup	60,000
33. MONTANA STATE UNIVERSITY, RECLAMATION RESEARCH UNIT AND MONTANA BUREAU OF MINES AND GEOLOGY Acid Generation from Western Mining	200,000
34. MONTANA STATE UNIVERSITY, MONTANA AGRICULTURAL EXPERIMENT STATION, EASTERN AGRICULTURAL RESEARCH CENTER The Influence of Conservation Tillage Practices on Insect Pests of Small Grains	30,000

APPLICANT/PROJECT	GRANT AMOUNT RECOMMENDED*
35. ROOSEVELT COUNTY CONSERVATION DISTRICT Saline Seep Treatment	5,000
36. YELLOWSTONE COUNTY Urban/Rural Water Alert, Data Centralization and Utilization	100,000
37. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Giant Springs State Park Improvements	150,000
38. GLEN LAKE IRRIGATION DISTRICT Therriault Creek Syphon Construction	155,000
39. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Rosebud Park and River Access Development	105,000
40. MONTANA BUREAU OF MINES AND GEOLOGY Butte Mine Flooding Monitoring	133,195
41. MONTANA STATE UNIVERSITY, WATER RESOURCES RESEARCH CENTER Role of Clinker in the Hydrogeologic Regime of the Southeastern Montana Coal Region	44,400
42. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Fort Maginnis State Monument Improvements	35,000
43. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Yellow Bay Fence Construction	10,000
44. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Hell Creek Recreation Area Improvements	75,000
45. MONTANA STATE UNIVERSITY, PLANT AND SOIL SCIENCE DEPARTMENT Beaver Creek Fire Erosion Study	34,656
46. UNIVERSITY OF MONTANA, BOTANY DEPARTMENT Clark Fork Basin Denuded Zone Sediment: Effects on Germination and Net Productivity of Two Riparian Grasses	21,797

APPLICANT/PROJECT	GRANT AMOUNT RECOMMENDED*
47. LEWIS AND CLARK COUNTY CONSERVATION DISTRICT Lewis and Clark County Conservation Tillage Program	27,139
48. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS Clark's Lookout State Monument Development	142,760
49. EAST BENCH IRRIGATION DISTRICT McHessor-Dry Gulch Gravity Irrigation Project	697,295
50. MONTANA STATE UNIVERSITY, MONTANA AGRICULTURAL EXPERIMENT STATION Alternative Fuel Production Using Safflower Oil	200,564
51. MONTANA STATE UNIVERSITY, INSTITUTE OF NATURAL RESOURCES Demonstration of the CLAIM-II Computerized Coal Mine Reclamation Planning System	87,048

PROJECTS RECOMMENDED FOR NO FUNDING

Antelope County Water and Sewer District - Antelope Sewer Project

Chouteau County Conservation District - Teton River Elminate Spurge Program

Fort Belknap Community Council - Fort Belknap Abandoned Mine Tailings Project

Granite, Jefferson, Madison, and Butte-Silver Bow Counties - Southwest Montana Cooperative Noxious Weed Control

Lewis and Clark County Conservation District - Agricultural Land Project for Lewis and Clark County

Lewis and Clark Conservation District - Knapweed Containment Support Project

Lewis and Clark Conservation District - Noxious Weed Inventory and Mapping Project

Lewis and Clark Conservation District - Subcontracting Revolving Funds for Weed Control

Liberty County - Marias River Basin Weed Control Project

Little Beaver Conservation District and Fallon County Weed Board - Cottonwood Creek Knapweed Project

Little Beaver Conservation District and Fallon County Weed Board - Dugout Creek Leafy Spurge Control Project

McCone Conservation District - Conservation Tillage Demonstration

Missoula County Conservation District - Biological Control of Noxious Weeds Using Fungus

Montana Board of Oil and Gas Conservation - Reclamation of Abandoned Oil and Gas Exploration and Production Facilities

Montana Bureau of Mines and Geology - Consolidation of Water Data from Montana's Coal Region

Montana Bureau of Mines and Geology - Evaluation of Seismicity in the Cut Bank Region

Montana Bureau of Mines and Geology - Monitoring for Arsenic in the Madison River Alluvial Ground Water from Yellowstone Park to Three Forks

Montana College of Mineral Science and Technology - Assess the Use of a Natural and Waste Resource for Production of Trace Mineral Free Vegetables

Montana College of Mineral Science and Technology, Department of Environmental Engineering - Historic Arsenic Emissions in the Clark Fork

Montana College of Mineral Science and Technology - Ecological/Geochemical and Geotechnical Aspects of Hard Rock Mined Land Reclamation

Montana College of Mineral Science and Technology - The Effect of Exposure to Radon Progeny Radiation on Mortality Rates in Butte Homes

Montana College of Mineral Science and Technology - Mining Subsidence Study

Montana College of Mineral Science and Technology, Department of Environmental Engineering - Quantification, Characterization, and Control of Fugitive Dust Emissions from Tailings and Waste Dumps

Montana Department of Agriculture - Montana Coordinated Weed Management Project

Montana Department of Commerce - Resource Development Impact Mitigation Program

Montana Department of Fish, Wildlife and Parks - Makoshika Road Paving Project

Montana Department of Fish, Wildlife and Parks - Noxious Plants and Their Control in Relation to Wildlife Using State Wildlife Management Areas

Montana Department of Fish, Wildlife and Parks - Region I Asphalt Roads

Montana Department of Fish, Wildlife and Parks - Region 5 Road Maintenance

Montana Department of Fish, Wildlife and Parks - Riparian Reclamation and Conservation Project

Montana Department of Fish, Wildlife and Parks - South Sandstone Dam Repair

Montana Department of Health and Environmental Sciences, Water Quality Bureau - Non-Point Water Quality Improvement Project

Montana Department of Health and Environmental Sciences - Water Quality Protection Fund

Montana Department of Natural Resources and Conservation and Rock Creek Water Users Association - Cooney Dam Rehabilitation

Montana State University - Museum of the Rockies Natural History Building

Montana State University - Study of the Potential for Development of a Commercial Whitefish Industry in Montana

Montana State University, Cooperative Extension Service - Effects of Three-Year Sheep Grazing on Knapweed Infested Rangeland

Montana State University, Cooperative Extention Service - Prescribed Burning to Improve Range Resources in Southwestern Montana

Montana State University, Department of Agricultural Engineering - Development of Native Vegetation Seeder for Reestablishing Diverse Ecosystems on Disturbed Lands

Montana State University, Department of Biology - Influence of Acid Precipitation on Aquatic Resources

Montana State University, Department of Biology - Restoring Stream Habitat in Lowland Creek

Montana State University, Department of Civil Engineering/Engineering Mechanics - Guidelines for Assessing Environmental Impacts of Small-Scale Hydropower Projects

Montana State University, Department of Earth Sciences - Recovery Rates for Disturbed Timberlines

Montana State University, Engineering Department - Development and Demonstration of a Rangeland Improvement Machine for Montana

Montana State University, Industrial and Management Engineering Department - Short Course in Water Planning Model Development

Montana State University, Institute of Natural Resources - Environmental Impact Statement Review Center

Montana State University, Plant and Soil Science Department - Advancement of Montana State Climate Program

Montana State University, Plant and Soil Science Department - MAPS for Land Resources Technology Transfer

Montana State University, Plant and Soil Science Department - A Program to Eradicate Dyers Woad

Roosevelt County Rural Water District - Roosevelt County Rural Water System

Roosevelt County Weed District - Coordinated Leafy Spurge Control Project

Sheridan County - Coalridge-Dagmar South Road Paving

Sheridan County (for Reserve Sewer District) - Sewer System for Community of Reserve

Tiber County Water District - Training and Technical Assistance Advisor (for Montana Rural Water Systems, Inc.)

University of Montana Chemistry Department - Tested Bagged Knapweed Silage as a Winter Feed for Cattle

Whitefish County Water and Sewer District - Whitefish Critical Area Identification and Preliminary Engineering

Yellowstone County - Critical Lands Inventory

Yellowstone County - Homestead Oxbow Area Water System

APPLICANT NAME: Montana Department of Agriculture

PROJECT/ACTIVITY: Weed Control Trust Fund and Coordinated Weed Management

GRANT AMOUNT REQUESTED: $1,000,000

TOTAL PROJECT COST: $1,732,189

PROJECT DESCRIPTION

Uncoordinated weed control efforts over the years have often proved unsuccessful, have not been cost-effective, and have been frustrating to all participants because they lacked long-term direction and commitment, and because they lacked the necessary funds to get an effective start. The Department of Agriculture proposes to aid communities with technical assistance and encouragement where needed, and provide seed monies to start an effective program.

The purpose of this project is twofold: first, to establish a program to provide technical and financial assistance to local communities who are developing and implementing coordinated weed management projects; second, to establish a weed trust fund designed to encourage long-term development and continuation of local coordinated weed management programs.

TECHNICAL FEASIBILITY ASSESSMENT

This program would be administered by the Montana Department of Agriculture's weed coordinator under the supervision of the Director. With initial funding of $1 million from the legacy program, a Weed Trust Fund would be established using at least half of the grant ($500,000). The remainder would be used to fund the top-ranked weed proposals that were submitted to the Department of Natural Resources and Conservation for consideration under the legacy program. It has been estimated by DNRC staff that the top four weed projects could be funded at a total cost of approximately $490,000. The Department of Agriculture would take the top-ranked projects as determined by the DNRC staff and review them to ensure that each project has the support of a local group (weed district, conservation district), shows some type of cooperative effort, and has an integrated or innovative approach to weed management.

The department would develop a $2.5 million trust fund with yearly grants of approximately $250,000 available to local communities. The Weed Trust Fund would be supported by a one-cent herbicide tax and, possibly, a .1 mill levy. Other sources of revenues, such as gifts and grants, would also be accepted. Once the initial legacy weed control requests are reviewed and funded, the department would establish a ranking system similar to that used by DNRC staff in reviewing Renewable Resource Development grants. A Trust Fund advisory council would be formed and used to establish important ranking criteria and make final review and recommendations on grant requests.

FINANCIAL ANALYSIS

Total Project Cost		$1,732,189
Funding Sources	Amount	
1. Legacy	$1,000,000	
2. Applicant	34,798	
3. Cooperators	697,391	
Total Funding Contribution		$1,732,189

One half of the legacy grant ($500,000) would be applied toward establishment of the Montana Weed Trust Fund. The remaining $500,000 would be utilized in the following manner: 1) $6,000 for legal review, accounting, and auditing; 2) $5,000 for the MDA field expenses; and 3) $489,000 for grants to county entities and cooperators for development and/or implementation of community weed projects.

This cooperative program would result in a total of $489,000 being allocated for weed management projects and $34,798 being expended by MDA to assist in the development and implementation of these projects. Cooperators involved in the communities' weed projects would contribute $697,391 to the projects.

Contract administration would be accomplished by spending $14,673 of MDA monies and $6,000 of grant monies for a total of $20,673. The grant monies would be used to support the accounting and auditing duties of managing and monitoring the community grants.

All the professional/technical personnel costs reflect expenditure of MDA monies. No grant monies would be used to support MDA professional or technical personnel.

ENVIRONMENTAL IMPACT ASSESSMENT

The overall environmental impact of increased awareness and use of weed management techniques would be to improve weed control, enhance wildlife, improve recreational areas, and allow for better farm and ranch management.

Improved weed management state-wide can only help to improve farm, ranch, and forest management across Montana. As Montana agriculture producers become aware of all available weed management practices, including the integration of established weed control practices with new techniques, weed impacts on the environment will decrease. Local, state, and federal land managers must be included in this management goal to allow for state-wide weed control and containment.

PUBLIC BENEFITS ASSESSMENT

The funding of local coordinated weed management programs would ultimately benefit all Montanans. As the demonstration projects progress, landowners would see the benefit of cooperative weed control. These projects could demonstrate and encourage land managers in other areas to organize community weed management programs. The benefits accrued should far exceed the costs of the projects.

The goal of these projects is to enhance land quality and productivity. This would be accomplished through management efforts to prevent the continued spread of weeds and by containment of the weeds through control programs to prevent reinfestation.

Weeds that are allowed to go to seed provide a constant source of reinfestation to adjacent lands where landowners are trying to manage their weed infestations. As local weed coordination efforts develop in Montana, the benefit of these programs should become apparent. As the effectiveness of these efforts is shown, support of the programs by individuals and agencies should increase. It has been noted that most federal agencies are willing to support programs at the local level if all landowners cooperate. It is hoped that with long-term planning, both federal and state agencies would increase their weed control budgets as they see the effects of control on adjacent lands and the long-term benefits to all landowners when a coordinated plan is developed.

RECOMMENDATION

A grant of $1,000,000 is recommended for this project, contingent on DNRC approval of the project scope of work and budget, and on a documented commitment of other funding sources. The Trust Fund Advisory Council must represent a broad-based group of Montana citizens.

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APPLICANT NAME: Montana State University, Department of Biology

PROJECT/ACTIVITY: Stream Restoration from Placer Mining on Grasshopper Creek, Beaverhead County

GRANT AMOUNT REQUESTED: $58,226

TOTAL PROJECT COST: $63,877

PROJECT DESCRIPTION

Placer mining has disrupted the stream channel and the floodplains of Grasshopper Creek in and near the First Territorial Capitol State Park, located at Bannack. Habitat for trout was destroyed. In some areas, stream structure has not recovered to the point that it is good habitat, even after many decades. In other areas, it has been disturbed by mining repeatedly until recent times.

There are two sites that lend themselves to restoration as trout fishery habitat in and near the state park. The project sponsor, Montana State University (MSU), proposes to restore these sites to favorable habitat for trout.

Practical habitat improvement methods do exist that are applicable to the situations at hand. The project would extend the major trout zone of Grasshopper Creek downstream into the state park and beyond. This would enhance the attractiveness and recreational value of the park.

TECHNICAL FEASIBILITY ASSESSMENT

The project objectives include (1) providing MSU technical assistance and expertise in remedying the damage that placer mining has caused to stream habitat for trout, (2) having the restoration serve as demonstration of state-of-the-art technology that can be applied to streams similarly affected by mining, and (3) conducting research to evaluate the physical and biological effects of the restoration, with resulting information used to refine the technology.

The project methods would include preliminary observations and measurements, actual construction of the restoration devices (these devices will help to recreate natural streambanks), ongoing trout population research and final data analysis and report writing.

The project would begin in July 1985 and conclude in June 1987.

Expected results of the project are (1) improved trout habitat in Grasshopper Creek, (2) enhanced recreational value of the state park, (3) research information for further improvement of methods, and (4) demonstration of methods that can be used in similar situations.

Cooperative agencies in this project would be DFWP, the Beaverhead Soil Conservation District, the Soil Conservation Service (SCS) District Office, and the Bureau of Land Management.

FINANCIAL ANALYSIS

Total Project Costs		$63,877
Funding Sources	Amount	
1. Legacy	$58,266	
2. Applicant	3,611	
3. DFWP (in-kind)	2,000	
Total Funding Contributions		$63,877

Approximately 10 percent of the budget would be for contract administration, 30 percent for professional/technical costs, 36 percent for construction costs, 14 percent for MSU indirect costs, and 10 percent for a contingency and inflation factor.

Some equipment listed in the budget may be available through other means than purchase, e.g., electrofishing gear may be available through DFWP.

ENVIRONMENTAL IMPACT ASSESSMENT

The long-term positive environmental impacts of this project would be increased streambank stability and improved trout habitat in Grasshopper Creek. In addition, the results of this work may be very helpful for use in other similarly affected areas. Short-term environmental disturbance due to construction would occur, but should be minimal.

PUBLIC BENEFITS ASSESSMENT

This project would improve reclamation of mined land on Grasshopper Creek specifically and could contribute to similarly affected situations around the state.

This project would also enhance recreational opportunities at the First Territorial Capitol State Park by improving the trout fishery.

RECOMMENDATION

A grant of up to $58,266 is recommended contingent upon (1) DNRC approval of the project scope of work and budget, (2) DNRC approval of applicant's documentation that no party can be identified as liable or reasonably be held responsible for reclamation of the site(s), (3) receipt of written permission from the landowner(s) allowing the reclamation activities to be undertaken, (4) DNRC approval of reclamation plans and budget, (5) receipt of verification from the Department of Health and Environmental Science and the Department of State Lands that the proposed project is compatible with plans for handling the hazardous waste site located below the state park, and (6) receipt of assurance from the land and mineral rights owner(s) that the site(s) will not be re-mined without reclamation. "Assurance" is considered by the DNRC to be a legally binding agreement, such as a properly executed and filed covenant, that prevents any reclaimed area from being re-mined within the next 10 years and requires reclamation to premining conditions for any mining undertaken after the 10-year period.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Bannack Apex Mill Rehabilitation

GRANT AMOUNT REQUESTED: $227,370

TOTAL PROJECT COST: $227,370

PROJECT DESCRIPTION

Bannack has long been recognized as one of Montana's major historic sites. It is the site of the first major gold strike in the state and the first capital of Montana Territory. Founded in 1862, Bannack is a microcosm of Montana history and of the history of the mining frontier in the West. All phases of frontier political, social, and economic life are represented in Bannack history, including (1) the short "boom" period of the 1860s; (2) the period of the dredging in the 1880s and 1890s, and (3) the depression period of the 1930s.

The State of Montana became involved in Bannack in 1954, when the Beaverhead Museum Association of Dillon donated 17 parcels of land as a state park. In that year, the town site was designated a state monument.

One of the significant buildings in the town is the Bannack Mill. This structure's association with quartz mining in post-1900 Bannack makes it historically significant and illustrative of the later and more capital-intensive mining techniques. Although it is not in good condition, it has considerable interpretive potential because of its size, its remaining mining equipment, and the importance of mining in Bannack.

The old Apex Mill in Bannack was associated with early mining operations. The mill site consists of ore-crushing apparatus, a large building which houses wooden vats used for ore concentration, and several areas where tailings have been deposited.

Unfortunately, waste materials at the Apex Mill site contain varying amounts of toxic cyanide, arsenic, and lead compounds. Although exempt from regulation, portions of the wastes contain sufficient amounts of lead to meet the definition of an EPA toxic hazardous waste. The Department of Fish, Wildlife and Parks (DFWP) is not required to clean up and remove the wastes; however, DFWP desires to maintain the site as a tourist attraction that does not pose a hazard to human health or the environment.

DFWP proposes to restore the historic structures in Bannack and provide interpretive panels that will tell the historic mill story. DFWP also proposes to further evaluate the hazardous waste problem at the Apex Mill and to reclaim and remove the hazardous waste threat.

TECHNICAL FEASIBILITY ASSESSMENT

For the historic structures restoration portion of the project, initial preservation treatment would be stabilization of the structures to prevent further deterioration. A set of architectural drawings has been developed. The mill area has been fenced using funds provided by a Federal Surface Mining Control and Reclamation program.

Activities included in the hazardous waste clean-up portion of the project include preparing a sketch of the site showing the locations and volumes of waste materials. A brief history of the chemicals and processes used at the mill would be prepared, and the structures would be stabilized to prevent removal of wastes. Obvious exposed waste materials would be collected and placed in protective containers. Additional laboratory analysis of the wastes would be conducted. Water samples from Grasshopper Creek would be collected and analyzed to determine if compounds are being transported to the creek. Old electrical transformers at the site would be evaluated for the presence of PCB's (polychlorinated biphenols). Toxic area would be limed, covered with top soil, seeded, and fertilized. The stream would be protected from runoff.

Not enough technical data was prescribed to adequately determine if these were the most appropriate alternatives; however, the DFWP has worked with the Department of Health and Environmental Sciences (DHES) and EPA for over a year concerning this project. The need for the clean-up, and the historic significance of the Bannack site have been well documented.

FINANCIAL ANALYSIS

Total Project Cost		$227,370
Funding Sources	Amount	
1. Legacy	$227,370	
2. Applicant	-0-	
Total Funding Contributions		$227,370

Project costs include $5,000 for contract administration and $40,000 for professional services. Structure rehabilitation and interpretation panel costs would be $80,000. Hazardous waste clean-up, liming, and stream protection costs would be $70,000. Inflation and contingency adds $32,370 to the cost.

Not enough technical data was provided to conduct a thorough analysis of the financial request. Cost estimates were provided by the Department of State Lands and a historic consultant.

No other funding sources have been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from the project. Rather, positive impacts would result from the clean-up of hazardous wastes which, if left in their present state, could cause adverse impacts to water and air quality and public health.

PUBLIC BENEFITS ASSESSMENT

Through the preservation of the historic site of Bannack, a recreation site would be provided that would compensate for past resource extraction. The proposal would also provide investigation and cleanup of a hazardous waste site. Montanans would benefit from the reduction of hazardous waste in the environment and from the historical information and recreation provided from the restoration of the old mill.

RECOMMENDATION

A grant of up to $227,370 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Field and Office Programs - Ground Water Information Center

GRANT AMOUNT REQUESTED: $555,141

TOTAL PROJECT COST: $814,280

PROJECT DESCRIPTION

Many individuals, state, federal, and local governmental agencies, institutions of higher education, and others need ground water information in Montana. Over the years, a vast amount of ground water data has been gathered by many parties, including many of the entities mentioned. However, there is no central location for storage of this data and, therefore, no way ground water data can be readily obtained for use by those parties that need the information.

The Governor's Council on Ground Water has recommended that a Ground Water Information Center (GWIC) be established to provide better service to Montana's citizens and to prevent loss of important ground water data. The

GWIC would collect, manage, evaluate, and provide ground water data and thereby significantly help solve the ground water data management problem in Montana. Establishment of the GWIC would result in conserving, protecting, and allowing for the wise use of ground water in the coming decades.

TECHNICAL FEASIBILITY ASSESSMENT

Based on the assumption by the applicant that a $100,000 grant recommended under the Water Development Program would be received and used to purchase necessary computer and associated equipment, this application is for funding to support an office program and a field program. The office program would gather, evaluate and enter existing and incoming ground water data from around the state, as well as develop necessary data reporting forms and procedures to retrieve of data from the centralized system. With necessary computer equipment, office space, and manpower support provided by the applicant and the legacy support of the office program, the facilities and program normally referred to as the GWIC would become operational. The field program would primarily be a technical-assistance and field data-gathering program intended to provide state agencies and other ground water management decision makers with pertinent and accurate ground water resource information. This program would primarily undertake drilling, sampling, and other field activities as needed.

The Montana Bureau of Mines and Geology (MBMG) would control input to the GWIC data system. However, the data would be available to any user. Retrieval from the system would be possible with very little training. Any training needed would be provided by the MBMG.

Establishing the GWIC is feasible and appropriate and the GWIC would be of real value to those parties involved with management of Montana's ground water resources. The field program portion of the application, although of obvious value, would appear to represent somewhat more than is needed to make the GWIC operational and represents about 43 percent of the total project cost.

FINANCIAL ANALYSIS

Total Project Cost		$814,280
Funding Sources	Amount	
1. Legacy	$555,141	
2. Applicant	159,139	
3. DNRC -- Water Development Program	100,000	
Total Funding Contributions		$814,280

The total proposed project cost includes essentially $100,000 for computer equipment, $366,439 for the office program and $347,841 for the field program. The office program budget includes $327,257 for professional services, wages, benefits and indirect costs and $39,182 for such items as office supplies, furniture, computer services, and a 6 percent inflation factor. The field program budget includes $133,353 for professional services, wages, benefits, and indirect costs, $69,000 for travel and per diem, $39,000

for capital equipment, $54,000 for drilling costs, $17,600 for analytical services and the remaining $34,888 for supplies and miscellaneous equipment, miscellaneous expenses, and an inflation factor of 6 percent. A total of 5.0 full-time employee (FTE) positions would be supported under the office program, of which 1.75 FTE positions would be contributed by MBMG. The field program would require 2.0 FTE positions, all supported by legacy funds.

The MBMG would contribute a total of $159,139 in professional services, wages, benefits and indirect costs, office space, and computer services. This figure includes 1.0 FTE hydrogeologist and 0.75 FTE computer programmer.

ENVIRONMENTAL IMPACT ASSESSMENT

No short- or long-term negative impacts to the environment are expected to result from this project. Long-term positive impacts are expected to result from the increased knowledge of Montana's ground water resources and the improved availability of this knowledge and information to decision makers.

PUBLIC BENEFITS ASSESSMENT

This project would provide for research, demonstration and technical assistance to promote the wise use of Montana's natural resources, namely ground water. It would also improve the availability of information needed to protect the state's renewable resources and assess past or potential environmental damage from natural resource development. Protection and wise use of Montana's ground water resources would provide compensation for the project cost. All Montanans, users of Montana's ground water resources, and ground water management decision makers would benefit from this project.

RECOMMENDATION

A grant of up to $257,300 is recommended for this project to make the GWIC operational. This grant amount would support only the office program and is contingent upon (1) DNRC approval of the project scope of work and budget, (2) MBMG support in the equivalent amount of $159,139 over the biennium, and (3) MBMG contracting for the positions funded instead of using full-time or temporary full-time employees. The field program could be more appropriately supported by general fund or other sources. A total of $50,000 is included in this grant amount for "Consolidation of Water Data from Montana's Coal Region," which is a separate legacy application by the applicant. DNRC feels that the latter data-handling project can best be handled by incorporation in the GWIC project.

APPLICANT NAME: Anaconda-Deer Lodge County, Deer Lodge Valley Conservation District, Headwaters RC & D

PROJECT/ACTIVITY: Anaconda Soil Stabilization and Erosion Control

GRANT AMOUNT REQUESTED: $300,436

TOTAL PROJECT COST: $331,734

PROJECT DESCRIPTION

In the late 1800s and early 1900s, the Anaconda Copper Mining Company used wood extensively in its refining process. To obtain the large quantities necessary, most of the timber in the local area was harvested. As the technology of the smelting operation improved, coal, coke, and natural gas were used to replace cordwood in the operations. The removal of existing vegetative cover combined with heavy metal pollution in the soils and a harsh climate inhibited the reestablishment of a natural ground cover. Immediately after the harvesting operations, some areas had major problems with soil erosion. Two locations that developed the most severe soil loss problems were: (1) the Mill Creek area south of Anaconda, and (2) the "A" and "C" hills, which are adjacent to the city.

The sponsors of this project propose to reforest this critical erosion area of approximately 3,800 acres, the bulk of which is owned by Anaconda Minerals Co. or its subsidiaries, construct erosion control dams in lower gulches draining into the city proper, conduct noxious weed control, and plant ground cover in eroding areas.

TECHNICAL FEASIBILITY ASSESSMENT

During the last 20 years, several studies have been conducted on both the vegetation and soil problems associated with this area. The Soil Conservation Service (SCS) has estimated that about 60 tons of soil per acre per year are lost to erosion. In 1979, Bissell and Walsh noted that the smelter emissions had caused serious damage to the forest ecotypes within the area. They also found that soil pollutants occurred in concentrations and were not evenly spread out. Climate and topography affected these soil concentration variations. This erosion and soil contamination affects the reestablishment of trees. On their control sites, they observed up to 66 percent tree coverage, while within eight miles of the smelter site it dropped to less than 20 percent.

In the 1930s, it appeared that an attempt was made by the Anaconda Company or the WPA to construct some erosion control dams and headgates. However, these were not maintained and are now in complete disrepair and serve no useful purpose.

The sponsors would employ a forester who would be responsible for administering the reforestation part of this project. The sponsors' objectives would be to establish a minimum of 100 trees per acre ten years after planting. These trees would provide a minimum of 25 percent ground cover, which would reduce the current erosion by 50 percent. In 1985, 20,000 lodgepole pine seedlings in containers would be planted. During the spring of 1986 and 1987, second and third plantings of 40,000 lodgepole pine and Douglas

fir trees in containers would be planted. Each fall after planting, a field evaluation would be conducted to determine tree-survival rate and recommendations for improvements would be made.

The city-county portion of this project would consist of constructing 30 to 40 wooden and stone control and sediment-trapping dams in the lower gulches to prevent further erosion. The dams would be constructed according to SCS specifications. A hydrologist would be used. Planting ground cover in this area would deter runoff. Noxious weeds would be controlled under the direction of the county weed supervisor to assist the new plants to obtain desired growth. Assuming that all dams would be constructed in 1985, the project in 1986 and 1987 would be to continue to spray noxious weeds and seed-in bare areas in the spring and fall. The Anaconda-Deer Lodge County Planning Department would administer the program and coordinate activities with other involved agencies. Construction would take place from July through October 1985.

In order to revegetate the area described, we anticipate at least a ten-year continuing project. The tree planting would not hinder any existing or proposed reclamation projects in this area.

The requested funding is the first part of a long-term revegetation and reforestation project. Any information generated by this project, such as planting costs or techniques, would be available to anyone upon request.

FINANCIAL ANALYSIS

Total Project Costs		$331,734
Funding Sources	Amount	
1. Legacy	$300,436	
2. Anaconda-Deer Lodge Co. (in-kind services)	10,615	
3. Headwaters RC & D (in-kind services)	17,083	
4. Anaconda Minerals Co. (in-kind services)	3,600	
Total Funding Contributions		$331,734

The budget is well prepared and not excessive. The weed control portion might be reevaluated after the legislature and before any funding to correlate with any major state or regional weed control projects.

ENVIRONMENTAL IMPACT ASSESSMENT

The area has had severe environmental impacts that this project would address. Major benefits include revegetation and reforestation of the area to control erosion, sediment, and turbidity, and return the depleted area to its natural state. It would further provide noxious weed control and immediate erosion control through dam construction.

PUBLIC BENEFITS ASSESSMENT

The erosion has been severe enough to cause damage to streets and homes in the area. This detrimental action would be corrected. The barren hillsides would become valuable for wildlife habitat through revegetation and reforestation. Local water quality would be improved. A study would be made of the revegetation and reforestation rate on soils contaminated by heavy metals with the information provided to all interested parties.

RECOMMENDATION

A grant of up to $300,436 is recommended for this project subject to the following conditions:

1. the applicants provide proof to DNRC that "Superfund" money is not available for this project;

2. that proof of a party responsible for the degradation cannot be determined and liability for restoration is assessed; and

3. that design, construction plans, scope of work, and budget be approved by DNRC.

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APPLICANT NAME: Montana State University, Department of Biology

PROJECT/ACTIVITY: Stream Restoration, Broadwater County, Confederate Gulch and Deep Creek

GRANT AMOUNT REQUESTED: $151,752

TOTAL PROJECT COST: $163,974

PROJECT DESCRIPTION

Streams tributary to Canyon Ferry Reservoir and to the inflowing Missouri have suffered extensive physical disruption due to placer mining in the channels and to floods made more intense by past land-use problems.

A major effort has been started by the Department of Fish, Wildlife and Parks (DFWP) to improve sport fishing in Canyon Ferry Reservoir. A major component to the success of this program is the availability of spawning and rearing habitat in tributary creeks. Physical restoration of damaged tributaries will aid in providing the needed habitat.

This project's objectives are:

(a) To remedy damage to trout spawning and rearing capacity of channels caused by placer mining and land-use-intensified floods;
(b) To have restoration serve as demonstration of state-of-the-art methods that can be applied in similar situations; and
(c) To conduct research developing and improving methods of stream restoration and evaluating the physical and biological results.

Sites on two tributaries that typify the problems have been chosen for the project. Confederate Gulch represents the in-channel placer-mining damages of shallowness, lack of gravel and pools in steep reaches, and stream blockage at

the canyon mouth. Deep Creek has severe erosional movement of meander bends from flooding. Both streams have major potential as spawning and nursery habitat for the Canyon Ferry rainbow trout fishery.

The project would have three separate phases: (1) channel restoration at the site of placer mining, (2) development of fish passage through the blocked channel below placer mining, and (3) stabilization of flood-eroded stream banks in ways that enhance trout habitat.

TECHNICAL FEASIBILITY ASSESSMENT

Cooperating agencies would include Montana State University, Broadwater Soil Conservation District, Broadwater County Office of the Soil Conservation Service (SCS), DFWP, and U.S. Geological Survey.

The first phase of this project would be channel restoration at the site of placer mining. In a moderately steep part of Confederate Gulch, structural measures would be applied to create gravel riffles for spawning, as well as the pools and pocket water with cover needed for rearing of young trout.

The primary structures installed would be low log stabilization structures. Ten sill structures and 20 to 30 boulder clusters would be installed in a one-mile section of stream.

The second phase of the project would be clearing passage for fish through a blocked channel below the placer mining. Where gentler valley slope begins below the Confederate Gulch canyon, large amounts of gravelly sediment have been deposited. During normal-to-low flow, there is little or no surface flow for about two miles. This blocks free access for fish to and from Canyon Ferry Reservoir.

This phase would begin with research and design of a channel to be dug through the blockage. Excavation would be followed by installation of systems for bank stabilization and deflectors. Research to evaluate this work would involve monitoring fish migration by means of counting and tagging at weirs and upstream electrofishing.

Phase three would be stabilizing flood-eroded stream banks in ways that enhance trout habitat. A site has been selected for phase three--about a half mile of Deep Creek on the Green Valley Ranch. It is an ideal lowland alluvial site for demonstrating ways to simultaneously stabilize banks and create instream cover for trout.

The methods used would involve imbedding whole mature shrub-wouldow masses in the banks at some sites and, at other sites, stabilization with conifer trees cable-anchored to the bank and reinforced with rocks. These methods are less costly than riprap made entirely of rock, have more natural appearance, and provide for more cover for fish.

Products resulting from these three phases would enhance the trout fishery in Canyon Ferry Reservoir (through improved spawning areas, better access for trout up and down tributaries, and better rearing habitat for juvenile trout), demonstrate stream-management methods that can be used in similar situations, and document methods used and follow up research findings in report form.

The project is scheduled to begin in July 1985 and to be completed in June 1987.

FINANCIAL ANALYSIS

Total Project Costs		$163,974
Funding Sources	Amount	
1. Legacy	$151,752	
2. Applicant	7,222	
3. SCS and DFWP (in-kind)	5,000	
Total Funding Contributions		$163,974

Approximately six percent of the budget would be for contract administration, 30 percent for professional/technical costs, 36 percent for construction costs, 10 percent for MSU indirect costs, and 18 percent for a contingency and inflation factor. Some equipment listed in the budget may be available through other areas than purchase; for example, electrofishing gear may be available through DFWP.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be potential short-term adverse effects such as increased sedimentation and erosion during construction. Good construction supervision would help reduce these effects. The project sponsor would need to acquire "Natural Streambed and Land Preservation Act" permits (issued by the local conservation districts) and a "Short-Term Exemption to Exceed Turbidity Standards" from the Water Quality Bureau before construction could begin.

The long-term positive environmental impacts would include restoration of trout habitat, flood control, improved water quality because of decreased sedimentation and erosion, and restoration of riparian vegetation. With proper engineering and design work, no long-term adverse effects are anticipated.

PUBLIC BENEFITS ASSESSMENT

This project meets the goals of the legacy program by reclaiming mined land, promoting wise use of natural resources, and protecting renewable resources.

The general public, as well as the streamside landowners, would benefit from this project.

RECOMMENDATION

A grant of up to $151,752 is recommended contingent upon (1) DNRC approval of applicant's documentation that no party can be identified as being liable or can reasonably be held responsible for reclamation of the site(s), (2) receipt of written permission from the landowner(s) allowing the reclamation activities to be undertaken, (3) DNRC approval of reclamation plans and budget, and (4) receipt of assurance from the land and mineral rights owner(s) that the site(s) would not be re-mined without reclamation. "Assurance" is considered by DNRC to be a legally binding agreement, such as a properly executed and filed covenant that prevents any reclaimed area from being

re-mined within the next 10 years and requires reclamation to premining conditions for any mining undertaken after the 10-year period. DNRC questions the ability of the applicant to find a permanent solution to the problems created by the alluvial deposit at the lower end of Confederate Gulch and, therefore, no funds would be released for that portion of the project unless the proposed corrective actions can be shown to be effective.

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APPLICANT NAME: Montana Department of Health and Environmental Sciences

PROJECT/ACTIVITY: Hazardous Waste Management Collection and Transfer Program

GRANT AMOUNT REQUESTED: $1,069,000

TOTAL PROJECT COST: $1,069,000

PROJECT DESCRIPTION

According to a study performed for the Department of Health and Environmental Sciences (DHES) (Hazardous Waste Management Facility Study, July 1984), about 300 tons of hazardous wastes are taken off-site by established generators to out-of-state disposal facilities every year. The U.S. Congress has enacted legislation to lower the small-quanitity generator exemption, which will increase the quantities requiring disposal by about 300 tons annually.

Lowering the limit would increase the number of regulated generators in Montana significantly, as well as increase the volume and variety of regulated wastes. Many of these "new" generators would find it technically and economically difficult to comply with stringent hazardous waste transport procedures.

Transport of hazardous wastes to out-of-state facilities is already an expensive and complicated procedure due to the relatively small quantities and the long distances to disposal sites. With the enactment of the federal legislation, there will be an even greater need for a workable, efficient hazardous waste management system in Montana.

There are also a large number of known potential uncontrolled hazardous waste sites in Montana that are not eligible for Superfund cleanup efforts. State action will have to be taken at these sites.

The Solid Waste Management Bureau (SWMB), which administers the state hazardous waste program, requests funding through the legacy program for development of a hazardous waste management collection/transfer program. Based on the alternatives developed, a container storage/transfer station, in conjunction with a state-wide collection schedule, appears to be the most timely and efficient alternative.

The intent of the proposed project is to decrease the risk of environmental contamination by hazardous waste through safe, timely transport, proper disposal, and clean-up of hazardous waste sites. The regulating of smaller hazardous waste generators could lead to illegal disposal of hazardous chemicals in local landfills. Contaminated landfills, in turn, could become toxic waste sites. In addition, unsafe transport of hazardous wastes can lead to accidental spills. Existing hazardous waste sites are causing or have the

potential to cause severe adverse environmental impacts. By lowering the risk of contamination, the project could give protection to the state's valuable water and soil resources. The hazardous waste management program would have the advantage of providing service and promoting environmental protection for Montanans in all parts of the state.

TECHNICAL FEASIBILITY ASSESSMENT

The program would be developed in three steps: additional feasibility analyses, pre-design, and design/construction.

The 1984 Hazardous Waste Management Facility Study contracted by the SWMB was, in fact, only a pre-feasibility study. It was a general evaluation of hazardous waste management alternatives ranging from thermal oxidation to landfill disposal. The best alternative, according to this study, appears to be a transfer station system where wastes are brought to central collectors for pickup and removal. However, a variety of specific questions needs to be answered before design and construction can proceed. Therefore, the first phase of the project would be a thorough feasibility analysis to identify sites of waste, waste collection alternatives and economic analysis. If Phase I provides a suitable alternative, Phase II, the preliminary design phase would be enacted. The final phase, Phase III, would be the actual design and construction of the collection system. All work would be contracted to consulting firms.

The need and urgency for the program is well documented and well supported.

Because the feasibility study is the first step in the program, no technical data for actual design and construction of the project is available.

FINANCIAL ANALYSIS

Total Project Cost		$1,069,000
Funding Sources	Amount	
1. Legacy	$1,069,000	
2. Applicant	-0-	
Total Funding Contributions		$1,069,000

Phase I costs - $ 70,000 contracted services
Phase II costs - $ 45,000 contracted services
Phase III costs - $954,000 based on 1984 Hazardous Waste Management Facility Study

Phase I and II costs have not been detailed in the proposal.

Phase III cost estimates include $720,000 for capital outlay and $234,000 for operation and maintenance costs. Legacy or general fund moneys are being considered for future partial funding for this program. Waste generators would be charged fees to cover the balance of the program costs.

ENVIRONMENTAL IMPACT ASSESSMENT

Some short-term adverse environmental impacts may result in the construction and implementation of a hazardous waste transfer, collection and storage facility; however, these impacts would be offset by the short- and long-term positive impacts that would result from having a facility where waste could be properly and safely handled and stored, reducing threats to the environment and public health.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide investigation and cleanup of sites where hazardous and toxic wastes threaten the environment, through establishing a collection and transfer station for individuals, companies and agencies to properly dispose of waste.

All Montanans would benefit from having a place to dispose of toxic and hazardous waste, and from the environmental protection provided by the collection, transfer, and storage facility.

RECOMMENDATION

A grant of up to $800,000 is recommended for this project contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Government of Butte-Silver Bow

PROJECT/ACTIVITY: Butte Hill Mining Reclamation

GRANT AMOUNT REQUESTED: $8,136,452

TOTAL PROJECT COST: $8,136,452

PROJECT DESCRIPTION

The effects of past hardrock mining, milling, and smelting operations are readily visible throughout the Butte area and in particular in the Butte Hill area. Hundreds of shafts have been sunk and extensive waste dumps, open pits, and tailings areas have been created either in or near residential and business sections of Butte. The city of Butte proper is undermined by over 2,700 miles of underground mine workings and it is doubtful that any other place in the United States has a similar concentration of shafts and hazardous mine sites.

Many of the old mining operation sites and waste dumps are not adequately secured and constitute an existing health and/or safety threat to area residents. Little or no reclamation or permanent securing of physical hazards have occurred at most of the older sites. In addition, the public health is known to be endangered by water and air pollutants associated with previous mining activities. The Montana Air Pollution Studies (MAPS) confirmed that there is an inverse relationship between air pollution and a healthy pulmonary function. Ambient (fugitive) dust from waste dumps, open pits, and mill tailings areas continue to adversely affect air quality in the Butte area. Analyses of the ambient air quality have shown detectable levels of arsenic,

cadmium, lead, iron, and zinc. Arsenic and cadmium are suspected to be potential carcinogens when present in elevated quantities. In addition, high levels of silicates are in the air; the presence of free silica with iron dust has been shown to produce significant lung tissue changes. The potential or actual long-term public health exposure to polluted air are matters of significant concern when assessed in view of the suspected human carcinogens present plus the potential for synergistic toxicologic reactions to various air pollutants. These factors weigh as heavy circumstantial evidence of a recognizable public health threat, especially in light of statistics that reveal a suspected high rate of respiratory and circulatory disease in the Butte-Silver Bow community.

Surface erosion of the waste dumps apparently plays a major role in both air and water pollution in the Butte area. The barren slopes of the waste dumps erode causing the dump material to be deposited on city streets. The materials are then ground down by vehicles into a fine dust that becomes airborne, thus adding to the air pollution load. Much of the eroded material is carried into the Butte-Silver Bow storm sewer system and is eventually discharged into Silver Bow Creek. The effluent from the storm sewer contributes to the metal loading of Silver Bow Creek, which was designated in 1982 as a Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Previous studies have shown that storm water discharged from the Missoula Gulch storm sewer system contained significant concentrations of sulfate, iron, copper, zinc and manganese. In addition to the existing health and safety threats and air and water contamination caused by the old mining operations, the excessive erosion from the Butte Hill area is known to cause plugging of existing storm drainage systems, which in turn causes subsidence and flooding of public and private property. This flooding has been severe, damaging homes and other property and contaminating public play areas with heavy metal laden sediment. The acidic runoff has also caused deterioration of sidewalks, streets, and storm sewers, which has increased maintenance and repair costs.

The applicant proposes to reclaim previously mined lands or lands adversely affected by past milling and other mineral extraction and processing activities in the Butte Hill area. The comprehensive project includes four major components: drainage and erosion control, surface reclamation, recreational reclamation and reforestation, and storm sewer rehabilitation. The third component would eliminate current public health and safety problems and at the same time create green space and recreational sites to replace those lost through mineral extraction and processing activities. The proposed project also includes an extensive storm sewer system rehabilitation program on three of the community's major storm sewers. The three storm sewers are badly deteriorated because of age (they are 80 to 90 years old), subsidence, and the effects of abrasive material-laden storm runoff. The three storm sewers all contain areas that are so badly deteriorated that they are in danger of collapse. Collapse (failure) of the storm sewer system would have disastrous effects.

The project would consist of both design and construction activities. Briefly, the proposed drainage control component consists of diverting flows from the area located north of Woolman Street into the Berkeley Pit, either directly or via the underground mine system. Major runoff events would spill into the existing storm drainage system. Drainage from the Upper and Lower Missoula Gulch area would be diverted into the Syndicate Pit, which would be used as a very large detention pond that would discharge to the existing storm sewer system. The runoff from the waste dumps and the hill below the

Syndicate Pit and adjacent to the Anselmo Mine would be diverted into the Anselmo Mine shaft. Runoff discharged into the Anselmo Mine shaft would eventually reach the Berkeley Pit via the underground mineworks. Drainage from the area around the Steward Mine would be diverted into the Original #6 Mine shaft. Runoff discharged into the Original #6 Mine shaft would also find its way into the Berkeley Pit via the underground mineworks. The area located north and west of the Steward Mine area would be drained via a system of concrete-lined ditches directly into the Berkeley Pit, near the Kelly Mine.

Certain mined land areas would be regraded, covered with a layer of lime, alluvium and mulch, topsoiled and revegetated. Other problem areas would be excavated and removed material hauled to suitable disposal sites. The areas where material is actually removed and hauled away would also be reclaimed (as discussed above) and revegetated. Areas to be reclaimed and reforested for recreational use would also be reclaimed as discussed above.

In Butte, several ballfields are located on old mine dumps. Some of the dumps are known to consist of relatively innocuous overburden from nearby open pit mines and some are of unknown origin and chemical content. A major portion of the recreation project involves improvement of the playing surfaces on four existing ballfields, known locally as the Walkerville Field, and three Northwest Little League fields called Farm League Field, Pee Wee Field, and Major League Field. The fields have been used by area residents for 10 to 20 years. One area known as the Emma Mine site would be revegetated and developed into a large park that covers a city block.

The fourth major portion of the proposed project involves rehabilitation of approximately 11,000 feet of deteriorated storm sewer. The three major storm sewers to be improved are known as the Missoula Gulch, Buffalo Gulch, and Butte-Brewery Storm Sewers. It is proposed to line the sewers with a reinforced gunite material to restore structural integrity and correct offsets caused by subsidence.

TECHNICAL FEASIBILITY ASSESSMENT

The preliminary mining and milling site reclamation methods identified in the application appear reasonable and technically feasible. However, exact reclamation and other activities would be studied in detail during the design stage of the project and only cost-effective, technically feasible methods would be selected. The majority of the proposed drainage and reclamation activities appear to conflict with the Superfund project at this time.

The methods proposed for improving the four ballfields and developing the Emma Mine park also appear to be feasible. However, such improvements must be coordinated with the Superfund project.

The proposed method of rehabilitating the three large community storm sewers may be feasible and cost effective, but documentation of such was not submitted with the application. The storm sewer problem in Butte is uniquely complex and a detailed preliminary engineering study needs to be conducted before design or actual rehabilitation begins in order to identify and prioritize problem areas, study drainage and rainfall patterns, size storm sewers, identify alternative solutions, and recommend the most cost effective, technically feasible solution.

The applicant feels that the project could be essentially completed within a two-year period. However, given that the area is in a Superfund area, any portion of the proposed project that potentially conflicts with Superfund would probably not be cleared by the Department of Health and Environmental Sciences (DHES) and the Environmental Protection Agency (EPA) until late in

the biennium, at the earliest. As a result, it is unlikely that completion of construction on any such potentially conflicting portions could be accomplished by the end of the biennium.

No work has begun on the project presented in the application. However, a tremendous amount of studies and data gathering have been accomplished in the Butte area in recent years. The Montana Department of State Lands (DSL), EPA and Anaconda Minerals Company (AMC) have all funded previous studies in the area that addressed the problems caused by area mined lands. The Abandoned Mines Reclamation Program administered by DSL recently completed plans, specifications, and cost estimates for reclaiming eight (8) mine sites (one of which is the Emma Mine) in the Butte/Walkerville area. The EPA, through its Superfund project, is just beginning to study the area.

FINANCIAL ANALYSIS

Total Project Cost		$8,136,452
Funding Sources	Amount	
1. Legacy	$8,136,452	
2. Applicant	-0-	
Total Funding Contributions		$8,136,452

Overall, the project budget includes $112,000 for contract administration, $953,151 for design and construction consulting engineering services, $6,121,026 for construction costs, and $950,272 for contingencies. There is a lack of sufficient information to evaluate the adequacy and reasonableness of the cost estimate. Accurate cost estimates can be made only following completion of preliminary engineering.

Generally, construction only costs for the project break down as follows: drainage and erosion control - $1,367,749 (of which $131,430 would be for the Walkerville drainage ditch), surface reclamation - $681,277, recreation and reforestation - $860,172 (of which $271,436 would be for improvement of the four previously discussed ballfields and $267,699 would be for the Emma Mine park), and storm sewer rehabilitation - $3,211,830 (of which $609,180 would be for the Missoula Gulch Storm Sewer, $1,755,420 would be for the Buffalo Gulch Storm Sewer and $847,230 is for the Butte-Brewery Storm Sewer). According to the project budget, engineering costs typically run 15 percent of construction costs, inflation and other contingencies are estimated at 16 percent of construction costs, and administrative costs would be approximately two percent of construction costs. The estimated total costs for each of the specific projects identified above then would be the estimated construction cost times 1.33.

There are no other funding contributors on this project. EPA, DSL, AMC and others have spent or are spending considerable sums of money in the area either studying or correcting related problems, but such expenditures are not part of this project.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would have a significant net positive impact on the environment in the Butte area. No adverse environmental impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

The project would provide mined land reclamation, reforestation of areas damaged by mining, milling, or smelting activities, provide recreational areas to compensate for loss of recreation areas because of resource extraction and provide remediation of sites where hazardous and toxic wastes threaten the environment.

The improved condition of the land, improvements to air and water quality, and elimination of public health and safety hazards would provide compensation for the damages caused by resource development. The residents of the Buttearea would benefit directly from this project and all recreational and other users of the Silver Bow Creek and the Clark Fork River would benefit from improvements in water quality.

RECOMMENDATION

A grant of up to $545,000 is recommended for reclamation and improvement of the four identified ballfields, and design and construction of the Walkerville drainage ditch contingent upon (1) DNRC approval of reclamation sites, specific projects, scopes of services, preliminary engineering studies, reclamation and/or rehabilitation plans, specifications, and costs, (2) receipt of DHES and EPA notification that the specific project(s) do not conflict with Superfund activities and that the State of Montana is not incurring CERCLA liability for funding cleanup by funding such specific project(s), (3) receipt of deeds for the ballfield properties or easements from AMC for the applicant to continue to use the four identified ballfields for 20 years, and (4) receipt of DSL notification that the specific project(s) do not conflict with activities proposed by the Abandoned Mine Reclamation Program. According to DHES, the majority of drainage and erosion control and surface reclamation work proposed by the applicant (all except the Walkerville drainage ditch) conflicts with Superfund and is, consequently, not fundable. The DHES also indicates that the Emma Mine Park probably conflicts with Superfund. The DHES and EPA have indicated a willingness to investigate and evaluate the materials in the ballfield areas during the first part of their Superfund area investigation in order to expedite their approval of the proposed improvement projects at the four ballfields.

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APPLICANT NAME: Toole County

PROJECT/ACTIVITY: North Toole County Reclamation Project

GRANT AMOUNT REQUESTED: $783,539

TOTAL PROJECT COST: $783,539

PROJECT DESCRIPTION

Oil was discovered in North Toole County in the 1920s. Today, over 13,000 acres of the county contain refuse, equipment, machinery, vehicles, and dwellings abandoned as a result of diminished oil and gas exploration, extraction, and processing. In addition, oil-saturated soils, sludge pits, and waste water (brine) sites have contaminated ground water supplies, thereby

preventing revegetation and creating an aesthetically unpleasant appearance. In most cases, present landowners are not responsible for this situation, do not own oil and gas leases on the land on which they reside, and the responsible landowners cannot be identified. Agricultural producers lack venture capital to remove hazardous dwellings and equipment on owned or leased lands. Additionally, conditions of dilapidation and disrepair lend themselves to physical safety hazards for those working in and around these sites. Hazardous wastes associated with oil extraction and processing may also be present, though undocumented to date.

Toole County has proposed a reclamation planning and implementation program that would address oil-and-gas-production-related ground water contamination, soil contamination, abandoned equipment, and general surface reclamation.

TECHNICAL FEASIBILITY ASSESSMENT

The applicant has identified major goals of the proposed project as follows: 1) site identification and assessment; 2) assessment of existing ground water pollution and model future dispersion; 3) removal of abandoned equipment at seven pilot sites; 4) removal of rabid-animal breeding areas associated with the sites; 5) reclamation of impacted agricultural lands; and 6) provision for surface reclamation at production sites. This project is limited to seven sites covering 6,000 acres. The entire project is expected to require four years to complete. The first two years would cover site inventories, site cleanup, surface grading, and treatment of surface contaminants. The final two years would involve the actual seeding of disturbed areas, followed by evaluation and documentation of reclamation techniques.

The project would be coordinated with the Montana Bureau of Mines and Geology and the Triangle Conservation District. It would be administered by a five-member, local board. An executive secretary would be hired to administer contracts, perform office duties, and monitor project progress. This effort would produce seven sites involving 6,000 acres reclaimed for agricultural and other multipurpose uses. Results of this project could be applied to the remaining 7,000 acres in the area. The project is also expected to greatly improve both surface and ground water quality.

The need for this effort is supported by the serious environmental, aesthetic, and economic impacts imposed on this area from activities that damaged the area before current government standards were in effect.

FINANCIAL ANALYSIS

Total Project Costs		$783,539
Funding Sources	Amount	
1. Legacy	$783,539	
2. Applicant	-0-	
Total Funding Contributions		$783,539

The proposed budget is divided into categories as follows: 1) Contract Administration (executive secretary and operations) $27,000; 2) Triangle Conservation District (well drilling, sampling, analysis) $34,250; and 3) Montana Bureau of Mines and Geology (professional services, drilling, modeling) $147,500; Contracted Services (structure removal, sludge removal, grading, land treatments, seeding, repairs) $457,240; and Contingencies $117,549.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would result in significant, positive, long-term environmental impacts to the soil, water, and social/economic resources of the area. Short-term negative impacts would include decreased water quality and erosion from the reclamation activities. Possible problems could result from disposal of reclamation wastes.

PUBLIC BENEFITS ASSESSMENT

The project would provide direct reclamation of past oil and gas extraction in an area where the economy and natural resources have been impacted. The benefits would include improved soil and water quality, wildlife habitat, aesthetics, and local economy. These benefits go directly to local landowners, oil companies, and other area residents. Montanans would benefit from removal of oil-and-gas-production-related environmental damages.

RECOMMENDATION

A grant of up to $390,000 is recommended contingent on DNRC approval of the project scope of work and budget. The project scope using legacy funds should be reduced from seven sites to two sites in order to demonstrate the viability of the reclamation techniques and to provide cost and scheduling information for future projects. The project budget should be reduced from that recommended after the two sites are selected and approved by DNRC.

The grant is further contingent upon DNRC approval of the applicant's documentation that no party can be identified as being reasonably liable or responsible for reclamation of the project sites. The applicant should obtain written permission from the land and mineral rights holders, allowing the reclamation activities to proceed and certifying that the sites would not be redeveloped for mineral extraction without provisions for adequate reclamation.

APPLICANT NAME: Governor's Office

PROJECT/ACTIVITY: Clark Fork River Projects

GRANT AMOUNT REQUESTED: $130,550

TOTAL PROJECT COST: $168,100

PROJECT DESCRIPTION

Over 120 years of mining, mining processing, agriculture, timber harvesting, hydropower development, and population growth have adversely affected the Clark Fork River system. Mining activities have denuded hillsides, left empty pits, and sterilized whole streams in the Butte/Anaconda area. Water quality has been affected as far downstream as Milltown, and the floodplain in between has been contaminated with copper and other heavy metals. Dams have altered natural streamflows and degraded water quality. Municipal and industrial plants have added nutrients to the river, and agricultural and timber harvest practices have contributed to water quality degradation.

Concern over these abuses to the Clark Fork River has prompted the Department of Health and Environmental Sciences (DHES) to designate the Clark Fork River as a priority water body. Governor Schwinden has established the Clark Fork River Basin Project to coordinate efforts to maintain or improve water quality. The Governor's Office proposes two monitoring studies on the Clark Fork.

1.) Clark Fork River Monitoring

While nearly 50 studies addressing water resources of the Clark Fork are planned, in progress, or recently completed, none contains a plan to monitor the long-term and cumulative effects of past, present, and future impacts to the water quality of the Clark Fork River. In this legacy proposal, the Department of Health and Environmental Sciences (DHES) would collect data in a fixed station water quality monitoring program on the Clark Fork River and major tributaries from Silver Bow Creek above the Warm Springs Pond to the Idaho border. The grant would allow the program to be carried out for one year. The monitoring results would help detect possible violations of water quality standards, and provide data for water quality management decisions. The biological health of the river would be assessed, which would allow changes in water quality from resource development, reclamation, and pollution control efforts to be documented.

2.) Clark Fork River Suspended Sediment Sampling

With mining and smelting activities nearly curtailed, one of the remaining threats to downstream water quality comes from sediment sources laden with toxic trace metals. These sources are within or near stream courses. The toxic sediments can migrate into streams from overland runoff of rainfall and snowmelt, flooding, bank erosion, and wind action. Some of the problems have been compounded by the existence of the mainstream reservoirs, which capture upstream sediments contaminated with toxic trace metals, and which

periodically release the metals resulting in downstream fish kills and other problems. While the combined sources of ponds, tailings and stream beds seem to be a potential long-term reservoir for toxic metals, only sparse information is available for metal concentrations in sediments from the sources described. The Governor's Office, with the U.S. Geological Survey (USGS), proposes to design and carryout a data collection program to document the transport of metals in the suspended sediment in the upper Clark Fork River system and to examine the relationship of metals to the sediment. The effort would entail collection of suspended sediment samples at key locations on the mainstem of the river and selected tributaries suspected of contributing heavy-metal loads.

TECHNICAL FEASIBILITY ASSESSMENT

1.) Clark Fork River Monitoring

The program would use existing U.S. Geological Survey (USGS) streamflow gaging stations and would complement the suspended-sediment sampling proposed by the USGS. The monitoring program has the support of the Clark Fork River Basin Project and would be further designed with advice from the Clark Fork River Interagency Task Force. No studies would be duplicated.

Monitoring now being conducted with funds provided from EPA, and the monitoring to be funded through a legacy grant, would provide two years of data which would be essential in providing data used in making critical decisions about the management of the Clark Fork River.

2.) Clark Fork Suspended Sediment Sampling

Sediment samples would be collected at two main stations at Deer Lodge and above Milltown Dam to document the suspended sediment load passing through the river system. Other sampling stations would be established to identify the sources of sediment. Samples would be analyzed for suspended sediment concentration, metal content and particle-size distribution, and organic content. The study would be designed and implemented by the USGS with input from the Clark Fork Interagency Task Force. It would complement several related projects currently underway or planned by other state and federal agencies including Superfund, wastewater discharge, and instream flow projects.

In addition to providing administrative continuity to existing or planned Clark Fork studies, the project would identify what additional information is most urgently needed if the water quality and fishery problems facing the basin are to be adequately understood. By taking a coordinated approach, duplication of effort can be minimized, thus helping stretch the money available for investigating the Clark Fork's problems.

The project would encourage funding for new studies that fill critical information voids and for which there is a concensus of need among state, federal, industry, and university experts and citizens working and living within the basin. The forum for this concensus would be provided by a Clark Fork Interagency Task Force established by the Governor's Office.

Towards the termination of the project, a report would be prepared that would carefully describe what is currently known about water-related problems within the Clark Fork River Basin and that would provide a framework for their resolution. The document would analyze the range of pending resource management decisions that must be made if the quality of the Clark Fork waters is to be maintained or improved.

FINANCIAL ANALYSIS

1.) Clark Fork River Monitoring

Total Project Cost		$102,000
Funding Sources	Amount	
1. Legacy	$97,500	
2. Applicant	$ 4,500	
Total Funding Contribution		$102,000

Project costs include $5,000 for contract administration, $5,500 for mileage, per diem and other expenses, $29,750 for an Environmental Specialist III employee for the Water Quality Bureau, and $8,250 for personnel for conducting macroinvertebrate and periphyton analysis. Laboratory costs would total $32,000, based on sampling 20 stations 16 times per year at a cost of $100 per sample. Supplies, equipment and computer costs would be $1,500, and inflation and contingency adds $20,000 to the project cost. Monitoring costs appear reasonable and adequate. The WQB employee to be funded by this project is now being funded by EPA funds. Those funds are unlikely to be available after the end of fiscal year 1984.

2.) Clark Fork River Suspended Sediment Sampling

Total Project Cost		$66,100
Funding Sources	Amount	
1. Legacy	$33,050	
2. USGS	$33,050	
Total Funding Contributions		$66,100

Fifty percent of the costs of this proposal would be paid by USGS under its cost-share program for governmental agencies. USGS's Helena office would perform this study under a contract with the Governor's Office. Daily administration of the project would be the responsibility of USGS.

Contract administration costs, travel and overhead would be $22,400. Costs for professional hydrologists and samplers would be $15,800, and laboratory analyses, computer charges and report preparation would total $18,800. Inflation and contingency would add $9,100 to the project cost. Cost estimates appear reasonable and adequate.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project. Results from monitoring may result in positive action that would reclaim existing problems or prevent future impacts to the river.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide research to assess past or potential environmental damage resulting from natural resource development. The information generated from the monitoring may result in action that would reclaim or reduce impacts and would compensate Montanans for damages caused by adverse environmental resource extraction. Primary benefactors would be those people living in areas along the Clark Fork River. All Montana citizens would benefit if results from monitoring promote action for reclamation and reduction of pollution in the Clark Fork River basin.

RECOMMENDATION

A grant of up to $100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Written documentation of the USGS financial commitment must be provided.

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APPLICANT NAME: Department of Natural Resources and Conservation, Conservation Districts Division

PROJECT/ACTIVITY: Reclamation of Streambanks and Adjacent Areas Damaged by Placer Mining

GRANT AMOUNT REQUESTED: $100,000

TOTAL PROJECT COST: $100,000

PROJECT DESCRIPTION

In many areas of western Montana the effects of past and present placer mining activities on streambeds, streambanks, and adjacent areas are profound. The natural streambank and adjacent areas in many drainages have been replaced with unsightly windrows of placer spoils. These spoils are typically unstable, and contribute to the turbidity and sediment loads of the numerous affected streams and because of the amount of disturbed area and poor soil quality involved they provide a nursery site for noxious weeds. Much of the damage was done by placer mining activities during the late 1800s or early 1900s and those parties responsible for the damage are either unknown or cannot be held accountable for reclaiming the areas.

The applicant proposes to use the grant to finance the design and construction of reclamation projects on priority areas affected by placer mining activities in the North Powell, Jefferson County, Ruby Valley, and Meagher Conservation Districts (CDs). Each of the four CDs listed have expressed an interest in reclaiming placer-mined areas within their districts.

TECHNICAL FEASIBILITY ASSESSMENT

Reclamation of placer-mined streambanks and adjacent areas would be technically feasible and effective. Reclamation measures would typically consist of vegetation of disturbed areas, installation of erosion control structures, stabilization of banks and slopes, revision of drainage patterns and use of numerous other conventional conservation practices and reclamation

techniques. Specific sites have not yet been selected within each CD. That the individual CDs would select the priority site(s) within their district and design and implement the reclamation plan. The CDs would solicit input from state and federal agencies (including the Soil Conservation Service) and where appropriate, private consultants to develop such reclamation plans.

Although placer-mined area reclamation techniques are typically quite straightforward and effective, evaluation of the technical feasibility of plans proposed under this application cannot be accomplished due to a lack of details and specifics on sites, problems and proposed reclamation plans.

FINANCIAL ANALYSIS

Total Project Cost		$100,000 (four $25,000 projects)
Funding Sources	Amount	
1. Legacy	$100,000	
2. Applicant	-0-	
Total Funding Contributions		$100,000

Existing personnel from the Conservation Districts Division of DNRC and personnel from the CDs would provide contract administration at no cost to the project(s). Since specific sites have not yet been selected, actual project cost estimates have not yet been made. Insufficient information was submitted to provide for evaluation of cost estimates. Very generally, the applicant estimates that typical project costs would break down as follows: reclamation plan development - 25 percent; materials and supplies -- 30 percent; and labor and equipment - 45 percent. Some donated time would result from state and federal agency participation in reclamation plan development and possibly by affected landowners during construction, although no firm commitment is on hand.

ENVIRONMENTAL IMPACT ASSESSMENT

Streambank work very near any live stream would likely result in an unavoidable short-term increase in turbidity in the stream. Any such increase would be minor compared to the long-term benefits that would result from a successful reclamation project. No long-term adverse environmental impacts are expected. In general the reclamation project(s) undertaken would have a large net positive impact on the environment.

Typically the projects proposed by the applicant would need to acquire a "Natural Streambed and Land Preservation Act" permit (issued by the CDs) and a "Short-Term Exemption to Exceed Turbidity Standards" from the Water Quality Bureau before any construction work has commenced.

PUBLIC BENEFITS ASSESSMENT

The project(s) proposed would provide mined land reclamation where no party is liable for reclamation. Reclaiming the placer-mined areas would enhance the environment and protect the state's soil and water resources. Reclamation techniques used and knowledge gained from this effort would aid in

reclamation of other placer-mined areas throughout the state. Primary benefactors would be the residents of Jefferson, Madison, Meagher and Powell counties. The resultant improvement in water quality, soil conservation, fish and wildlife habitat, reduction of noxious weed nurseries, and improved aesthetics would be the compensation for the damages caused by the resource development.

RECOMMENDATION

Given that a specific site has not yet been selected, a grant of up to $50,000 is recommended contingent upon (1) DNRC approval of the site(s), (2) DNRC approval of applicant's documentation that no party can be identified as being liable or who can reasonably be held responsible for reclamation of the site(s), (3) receipt of written permission from the landowner(s) allowing the reclamation activities to be undertaken, (4) DNRC approval of reclamation plans and budget, and (5) receipt of assurance from the land and mineral rights owner(s) that the site(s) would not be re-mined without reclamation. "Assurance" is considered by DNRC to be a legally binding agreement, such as a properly executed and filed covenant, that prevents any reclaimed area from being re-mined within the next 10 years and requires reclamation to pre-mining conditions for any mining undertaken after the 10-year period. DNRC would solicit input from an interagency committee regarding the appropriateness of the selected project.

This grant would be for a demonstration project, in hopes that other districts would propose other such projects to the legacy program.

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APPLICANT NAME: Mile High Conservation District

PROJECT/ACTIVITY: Reclamation Techniques for Heavy Metal Contaminated Agricultural Lands

GRANT AMOUNT REQUESTED: $103,961

TOTAL PROJECT COST: $142,163

PROJECT DESCRIPTION

Agricultural land along the upper Clark Fork River drainage has been subject to contamination from mine tailings and airborn contaminants from smelter emissions for over 80 years. Extensive riparian land, upland pasture, and cropland are currently either not used or have limited productivity due to toxicity problems. Surface and ground water resources are also adversely affected by the contaminants, and little information is available about the vertical and areal distribution of the contaminants in the soil and the hydrological system of the area.

The Mile High Conservation District, in cooperation with the Headwaters Resource Conservation and Development area, proposes to develop reclamation techniques for heavy metal contaminated agricultural land in the Silver-Bow-Clark Fork Valley, while insuring that these changes in land use do not adversely affect surface and ground water in the area.

TECHNICAL FEASIBILITY ASSESSMENT

This proposal would evaluate differing lime rates for neutralizing heavy metals, and forage species successful in establishing vegetation on contaminated soils. It would demonstrate the effects of tilling as a reclamation technique, evaluate the metal concentrations in plant tissue samples and plant uptake, and develop optimum cost and return information for re-establishing hay and forage production. Mechanisms and rates of contaminant movement in the soil and ground water at the site would be monitored and documented. An inventory of general ground water quality in the Silver Bow Creek-Clark Fork Valley and an examination of the influence of surface waters would be conducted. Work on the first test plots has started with the use of coal severance tax funds administered by the Conservation Districts Division, DNRC.

The project plan was designed with input from the Soil Conservation Service (SCS), the Extension Service, and the Montana Bureau of Mines and Geology (MBMG). Two alternative reclamation techniques would be tested: tillage and comparison of differing lime rates. Impacts to ground water from these methods would be monitored and evaluated. The approaches are appropriate, and if successful, would provide an innovative method of reclaiming contaminated agricultural lands, provided the approaches are implemented. Reviewers question the need for some seepage runs proposed on the creek between German Gulch and the Race Track area, as well as domestic well inventories.

Personnel from MBMG and SCS, along with the land owner, would perform the work associated with this project. Data, maps, and results of the project would be published and made available to SCS, landowners, Department of State Lands, and the Silver Bow Superfund Project. This project must be coordinated with other agencies working in the Clark Fork Drainage to insure dissemination and implementation of project results. It must be assured that there would be no duplication of efforts with the Superfund projects, but that information from both projects would be complementary. The project could be accomplished within the funding biennium.

FINANCIAL ANALYSIS

Total Project Cost $142,163

Funding Sources	Amount
1. Legacy	$ 103,961
2. Applicant	$ -0-
3. MBMG	$ 13,244
4. SCS	$ 4,975
5. DNRC 223	$ 18,162
6. Landowner	$ 1,820

Total Funding Contributions $142,163

The $103,961 legacy grant would provide $8,617 toward contract administration; $51,488 for professional personnel services; $37,972 for travel, materials, and soils analysis, and $5,884 for contingencies. Cost estimates could be reduced if seepage runs and well inventories were eliminated.

The applicant has also requested funding for this proposal under the DNRC Renewable Resource Development Program. It has been recommended to the legislature that an $88,400 RRD grant be offered for this proposal.

ENVIRONMENTAL IMPACT ASSESSMENT

This project, if successful, would provide a solution to a severe problem which has been adversely affecting the environment for years. This solution would provide long-term, positive environmental impacts. No adverse impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide reclamation to agricultural lands contaminated from mine processing, and would demonstrate reclamation techniques which, if successful, would protect the state's soil and water resource. Results from this project could also be used to assess the potential and real environmental damage from the mining development. The improved condition of the agricultural land resource would provide compensation for the damages caused by resource development. Primary benefactors would be landowners in the Clark Fork River valleys of Deer Lodge, Powell, and Silver Bow counties. Montanans in general would benefit from a reduction in the pollutants adversely affecting the Clark Fork River.

RECOMMENDATION

A grant of up to $88,400 is recommended contingent on DNRC approval of the project scope of work and budget, and on input from and coordination with the Clark Fork Interagency Task Force and the EPA Superfund program. Written documentation for funding commitments from all funding sources listed in the application must be provided.

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APPLICANT NAME:	Governor's Office--Border Waters Clearinghouse Interagency Steering Committee
PROJECT/ACTIVITY:	Cabin Creek Reference to the International Joint Commission
GRANT AMOUNT REQUESTED:	$100,000
TOTAL PROJECT COST:	$400,000

PROJECT DESCRIPTION

The construction and operation of Sage Creek Coal Company's proposed Cabin Creek coal mine in southeastern British Columbia could seriously damage the water quality in Montana's portion of the Flathead Basin. The mine is proposed to be built near tributaries of the North Fork of the Flathead just a few miles from the U.S.-Canada border and the boundary of Glacier National Park.

Montana state government has extensively studied the mine plan and its potential impacts and has communicated those concerns to the governments of British Columbia and Canada. In 1984, the British Columbia government gave Stage II approval (approval-in-principle) to the mine and only a currently slack coal market has kept the mine sponsors from seeking the Stage III permits necessary to begin construction. It is at Stage III that operational requirements and performance standards will be imposed on the company.

Montana was recently provided with a new forum for expressing its arguments concerning the mine plan's deficiencies. The Cabin Creek issue has been placed before the International Joint Commission (IJC), a bilateral body of the two countries that has successfully resolved many transboundary water disputes since its inception in 1909. The IJC will spend 18 months (beginning in January 1985) analyzing the Cabin Creek case and will then recommend the conditions under which it believes the mine could open without harming the water downstream.

The IJC will appoint a joint U.S.-Canadian investigative board to study the problem posed by the proposed mine. The investigative board will have from four to five United States members, two of whom will likely be representatives from Montana state government. The investigative board will develop a detailed work plan for the investigation and will appoint three to five technical committees to assist them in investigating the various problems presented by the mine (for example, adequacy of the reclamation plan, water quality, impacts to the Flathead River, impacts to fisheries, etc.). In addition to the Montana board members, up to ten technical experts from Montana state agencies will be asked to serve on these technical committees. Deliberations by the board and the technical committees will provide the state with the opportunity to make its best case regarding the safe operation of the mine.

Vigorous participation in the IJC proceedings by state government will be essential to attaining recommendations favorable to the downstream environment. Protection of the Flathead basin is too important to Montana for the responsibility to be left exclusively to the federal government and its agencies. On the other hand, the brief but intense study period will strain Montana's governmental resources. Therefore, the Governor's Office requests a grant of $100,000 to allow Montana to effectively participate in the IJC proceedings.

TECHNICAL FEASIBILITY ASSESSMENT

Montana's goals in participating in the IJC deliberations are to

(1) encourage a revision of the mine design and reclamation plan to afford greater assurances against water pollution, the loss of migratory fishes habitat, and changes in water uses downstream,

(2) stipulate mitigation and compensation measures in the case of failure of water and sediment control structures or of reclamation,

(3) pursue auxiliary understandings between the U.S. and Canada on other subjects such as water apportionment, habitat protection for migratory aquatic and terrestrial species, regional development, and air quality.

Funding of this proposal would allow the following functions:

A. Testimony

Montana concerns regarding the Cabin Creek proposal are substantially documented in terms of information and arguments that can be found in the Flathead River Basin EIS, state agency records, technical critiques of the mine plan, information exchanges with British Columbia, and letters between the governor and the British Columbia premier between 1976 and 1983. There is a need for some updating, but most important is the effective presentation of this position in the hearings of the IJC and the meetings of the investigative board and the technical committees. Much of this presentation would be made by state agency personnel appointed to the investigative board and technical committees during their deliberations. These personnel would need to be not only technically competent, articulate, and persuasive, they must be supplied with supportive material throughout the deliberations.

B. Coordination and Monitoring

Because of multiple state voices in the Cabin Creek issue, it is crucial to the effective pursuit of the policy goals that all actions and presentations are complementary, consistent, and non-duplicative.

The Governor's Border Waters Clearinghouse (BWC) would coordinate the efforts of state agencies in Helena in presenting Montana's arguments before the IJC. These agencies will be charged with:

(1) making recommendations for representation on the investigative board and technical committees,

(2) monitoring the IJC deliberations to ensure that state policy goals are being pursued by,
   (a) circulating information on schedules of coming meetings, reports of all completed meetings and status of evidence presented,
   (b) developing and maintaining a mailing list of involved parties,
   (c) maintaining technical data files, documents and materials in a central location that would be used by the board and committees,
   (d) maintaining an updated chronicle of reference deliberation so that the governor and legislature can regularly determine whether or not Montana objectives are being effectively pursued.

C. New Study/Research

In the course of deliberations the investigative board or the technical committees may decide that new information is needed. Some of the information requests would be assigned to state agencies.

Since 1974, Montana has been preparing for possible Cabin Creek IJC reference through such actions as the recently completed Flathead Environmental Impact Study (EIS), water quality monitoring in Flathead Lake and its tributaries, Montana Bureau of Mines and Geology (MBMG) investigations at the proposed mine site in Canada, and the creation of the Flathead Basin Commission, the Border Waters Clearinghouse, and the Ad Hoc Committee on Canadian Relations. In 1982 and 1983, Montana provided extensive comments on Sage Creek Coal Company's mine application to the premier of British Columbia.

In anticipation of the Cabin Creek reference, the governor created the Border Waters Clearinghouse (BWC) in 1984. It has developed a strategy and workplan for liaison to the IJC. Six people, representing the Governor's

Office and five natural resource agencies (Department of Health and Environmental Sciences, Department of Natural Resources and Conservation, Department of Fish, Wildlife, and Parks, Department of State Lands, and Department of Agriculture) sit on the BWC. BWC has established working links to the Flathead Basin Commission, to the legislature (through the EQC), and to the Congressional delegation led by Senator Baucus. This committee would ensure that a cohesive, coordinated, and vigorous pursuit of Montana's objectives would be made. Two members of the Clearinghouse will sit on the IJC investigative board.

Although the final recommendation of the IJC is not binding on Canada, the prestige of this international tribunal is a great influence on both U.S. and Canadian public opinion and officials. This crucial 18-month study may afford Montana the chance to insist on the strictest standards of control over the mine operation and its effluents. Montana, by itself, cannot deny British Columbia the right to approve the mine, but a recommendation by the IJC on standards, mitigation, and compensation could significantly lessen impacts to Montana's water quality.

Cabin Creek is an international issue that does not fall within the conventional reponsibilities of a single state agency, nor within the political environment most state employees are accustomed to working. This proposal would be completed within the biennium.

FINANCIAL ANALYSIS

Total Project Cost		$400,000
Funding Sources	Amount	
1. Legacy	100,000	
2. State Agency In-Kind Services	200,000	
3. Federal Support	95,000	
4. Flathead Basin Commission	51,000	
Total		$400,000

Legacy contributions would include $25,000 for personnel and benefits for a contracted technical coordinator and secretary. Travel, supplies, and printing would cost $30,000, and $45,000 would be used during the 18-month period for research, equipment, supplies, and specialized personnel as determined necessary by the Investigative Board. Federal support has not yet been confirmed. The Flathead Basin contribution is contingent on the Federal funding.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts would result from this project. Rather, the state's involvement with the IJC may help to minimize the adverse impacts from the Cabin Creek coal mine on the water quality and wildlife resources of the Flathead Basin.

PUBLIC BENEFITS ASSESSMENT

This project would provide public benefits through providing research to assess potential environmental damage resulting from natural resource development. Primary benefactors would be the residents of the Flathead Basin, but all Montanans would benefit if the amount of pollutants entering Montana from Canada was limited.

RECOMMENDATION

A grant of up to $80,000 is recommended contingent on DNRC approval of the project, scope of work and budget, and on documentation of commitment from other funding sources.

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APPLICANT NAME: Montana State University, Water Resources Research Center

PROJECT/ACTIVITY: Environmental Fate of Cyanides and Heavy Metals from Historic Cyanide Leach Operations in the Judith Mountains

GRANT AMOUNT REQUESTED: $16,480

TOTAL PROJECT COST: $16,480

PROJECT DESCRIPTION

The Water Center at MSU is involved in research relative to state and regional needs. The Water Center does not have a permanent research staff. Annual research programs are selected from proposals submitted by faculty members within the university system, and the research is conducted by those members. Priority research areas are identified and proposals are screened by an Advisory Council composed of the heads of the state water agencies, state and federal water agency personnel, and representatives from industry, consulting firms, environmental groups, and the general public. The Water Center provides the administrative framework for the program. It receives and disburses the funds, monitors the progress on the projects, and receives, prints, and disseminates the final reports. The principal source of Water Center funding has been federal appropriations of approximately $115,000 per year. The 48th Montana Legislature appropriated $30,000 of state funds for the 1984-85 biennium, and some matching dollars and in-kind services have been available through other state resources. In March of 1984, Congress passed the Water Resources Research Act of 1984 that extends federal participation in the program through fiscal year (FY) 1989. This legislation authorizes funding of up to about $160,000 per year to the Water Center and requires a nonfederal match of one-to-one in the first two years, increasing to two-to-one nonfederal matching during the last two years.

MSU proposes to expand the research program of the Water Resources Research Center and to provide part of the state match required by the federal program through the use of legacy program funds. Because it is designed to blend with the federal program, the proposed project has been screened by members of the Advisory Council. This proposal will be integrated into FY 1985 and FY 1986 research programs along with the federally funded projects.

The environmental fate of residual cyanides in the tailings of abandoned cyanide leach operations is an area of pollution research that has received little attention. Cyanides have been assumed to degrade rapidly in the environment or to be tied up on refractory nontoxic forms. However, some workers question these assumptions under certain environmental conditions and point out that increased mobility of heavy metals associated with cyanide leaching could contribute to environmental degradation.

The Malden-Giltedge region of the Judith Mountains has more than 35 mine and/or leach sites in a relatively small area. Most of these date from the turn of the century, but there are a few current operations. The Water Quality Bureau has found a trace of cyanide in a stream near old mine tailings and lead has been reported as high as 910 ug/l by the Bureau of Land Management in another area. Both of these sampling operations were small in scope and conducted nearly two years ago. No ground water sampling has taken place.

The Judith Mountains consist of acid to intermediate intrusions, primarily in limestone sediments, and are located in an arid region. Because this area is fairly typical of many gold mining regions throughout the West, a study of contamination from mining wastes in this area should provide insights to possible water quality problems associated with many leach operations.

MSU proposes to assess the environmental fate of cyanide and heavy metals remaining in the tailings of abandoned cyanide leach operations by analyzing various components of the tailings and the nearby aquatic environment for several cyanide and heavy metal fractions.

TECHNICAL FEASIBILITY ASSESSMENT

Procedures for this proposal include:

1) Determining what levels of cyanides and heavy metals remain in the tailings by analyzing cores for total and soluble cyanides and for total and leachable metals;
2) Determining whether erosion from tailings is likely to result in cyanide or heavy metal contamination of surface water by analyzing surface samples of tailings near surface waters for the above constituents;
3) Determining whether cyanides or heavy metals appear to be leaching into ground water by analyzing ground water underneath tailings and upgradient and downgradient from tailings (if possible) for total and soluble cyanides and soluble metals;
4) Determining whether contamination is currently reaching surface waters in detectable quantities by analyzing nearby surface waters upstream and downstream of tailings for total and soluble cyanides and total and soluble metals;
5) Determining whether contamination reached surface waters previously and persists in sediment by analyzing upstream and downstream sediments for total cyanides and total metals;
6) Determining whether instream conditions are such that refractory cyanide fractions might break down into toxic forms (assess temperature, light, pH, dissolved oxygen).

Reviewers support the proposal but suggest expanding the water analysis portion of the proposal to cover a broader scope of heavy metals. A more thorough description of the final product and how it will be used is needed.

This project was ranked eighth of 16 proposals reviewed by the Montana Water Resources Research Center. The project could be completed within the biennium.

FINANCIAL ANALYSIS

Total Project Costs		$16,480
Funding Sources	Amount	
1. Legacy	$16,480	
Total Funding Contributions		$16,480

Salaries and benefits would total $10,118; supplies, travel, and lab work costs would be $3,616. Indirect costs to MSU would be $2,746. Cost estimates are reasonable, but may be inadequate to cover expanded laboratory analysis suggested by reviewers.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts would result from this proposal. Positive impacts may occur if project results prompt action to control cyanide contamination now affecting surface and ground water.

PUBLIC BENEFITS ASSESSMENT

The proposal would provide research to assess past and potential environmental damage resulting from natural resource development. Montanans would benefit if results prompt action to control and reduce cyanide and heavy metal contamination of surface and ground waters.

RECOMMENDATION

A grant of up to $20,000 is recommended contingent on DNRC approval of project scope of work and budget. Provisions for additional heavy metal sampling must be included in the scope.

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APPLICANT NAME: City of Red Lodge

PROJECT/ACTIVITY: Coal Miner's Memorial Park Revegetation

GRANT AMOUNT REQUESTED: $241,930

TOTAL PROJECT COST: $241,930

PROJECT DESCRIPTION

The City of Red Lodge proposes to stabilize an abandoned coal mine reclamation site and an abandoned sanitary landfill site by planting trees and shrubs and installing an irrigation system to prepare the area for use as the Coal Miner's Memorial Park and Red Lodge Zoo.

The project site is an abandoned mine dump and an abandoned sanitary landfill site which have been declared a public health and safety hazard by the Department of State Lands (DSL) and the Department of Health and

Environmental Sciences (DHES). Both sites now adversely affect the ground water and surface water quality of Rock Creek, and are aesthetically unpleasant.

DSL would reclaim the area, seed it in lawn grass, and fence the site to keep out livestock. It would also excavate ponds to be used for water storage, waterfowl habitat, and aesthetic purposes. Funds from this grant would purchase shrubs and trees for further stabilization and landscaping purposes, and provide an irrigation system for the entire park and zoo development. Funding for further development of the park and zoo has not yet been secured.

TECHNICAL FEASIBILITY ASSESSMENT

Technically thorough reclamation plans have been developed by DSL for this project site. The Red Lodge Zoological Society developed an extensive master plan detailing the development of the park and zoo at the reclaimed area. The two entities are working together on this project.

The selected alternatives appear reasonable. No irrigation would take place on the landfill site to prevent leachate from affecting the ground water. Any structures in this area would be properly vented to allow the escape of methane gas which could be produced through the decomposition of the solid waste.

This project would be completed within the biennium.

FINANCIAL ANALYSIS

Total Project Cost		$241,930
Funding Sources	Amount	
1. Legacy	$241,930	
2. Applicant	-0-	
Total Funding Contributions		$241,930

Of the $241,930, $11,000 would be for contract administration and professional costs. An additional $197,560 would be for labor and material costs for plants and the irrigation supplies, and $33,370 for inflation and contingency. These cost estimates appear reasonable and adequate.

The total estimated cost for the entire reclamation park development and zoo project is over $2 million. The $241,930 grant represents 12 percent of that cost.

ENVIRONMENTAL IMPACT ASSESSMENT

The vegetative plantings and irrigation system would help to stabilize the reclamation work. Without this stabilization, wind erosion and storm runoff could erode the reclamation area, resulting in airborne particulates and potential adverse water quality impacts to Rock Creek. This stabilization effort would prevent these problems and would result in long-term positive environmental effects. Some short-term adverse effects could result from construction activities, but they would be minimal.

PUBLIC BENEFITS ASSESSMENT

This project would help to provide a recreational area in a reclaimed mine dump to the benefit of the general public, including Red Lodge residents.

Benefits to the public from the vegetative plantings and irrigation system would include the improvement of the land quality by stabilizing the reclaimed area, which would result in erosion control and the improvement to the quality of Rock Creek. This improved water quality would enhance fish and wildlife habitat and improve recreational opportunities. New business and employment opportunities would be increased through the development of the park and zoo complex.

RECOMMENDATION

A grant of up to $241,930 is recommended contingent on DNRC approval of the project scope of work and budget. The combined total of grant funds received from the Water Development, Renewable Resource Development, and Montana Legacy Programs shall not exceed $241,930.

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APPLICANT NAME: Montana State University; 49th Parallel Institute

PROJECT/ACTIVITY: Montana/Alberta Milk River Joint Impoundment Assessment

GRANT AMOUNT REQUESTED: $ 91,104

TOTAL PROJECT COST: $111,104

PROJECT DESCRIPTION

There have been shortages of water in the Milk River Basin for years. Recent droughts have aggravated this problem, and recently the basin was closed to new appropriation of water.

During the past several years, governmental agencies including the U.S. Bureau of Reclamation (USBR), U.S. Geological Survey (USGS) and DNRC have been involved in attempting to clearly define the problem, to develop alternative solutions and to compare these alternatives. Some of these alternatives have been diversion of water from the Marias to the Milk via a canal and pumping water from the Missouri at Virgelle. At the same time, the Canadians have been exploring the development of an impoundment on the Milk River so that they will be able to take full advantage of their apportioned share of the river under the 1909 Boundary Waters Treaty. There is opportunity to further explore the feasibility of joint development of the project in Canada so that some U.S. water could be stored, possibly even carried over from years with surplus water to years of drought.

TECHNICAL FEASIBILITY ASSESSMENT

The governor recently established the Canadian Borders Waters Clearinghouse with representatives from several state agencies to deal with the Cabin Creek, Poplar River, Kootenai, and Milk/St. Mary's issues between

the U.S. and Canada. Four state agencies would serve on an Interagency Task Force for this group, and the 49th Parallel Institute would serve as staff for the Clearinghouse and the Task Force. In this capacity, the 49th Parallel Institute is applying for these funds to facilitate further analysis of the joint impoundment option which would be compared to other alternatives. The Institute would be the organizing agent, administrative comptroller, and information disseminator for this project.

FINANCIAL ANALYSIS

Total Project Costs		$111,104
Funding Sources	Amount	
1. Legacy	$91,104	
2. Federal agency	20,000	
Total Funding Contributions		$111,104

The scope of work and budget would be established to determine financial feasibility.

ENVIRONMENTAL IMPACT ASSESSMENT

This project should have positive environmental impacts if it leads to a full review of alternatives and to development of the most economical, environmentally sound project.

PUBLIC BENEFITS ASSESSMENT

This proposal fits under three proposed legacy categories: (1) to provide for research, demonstration, and technical assistance to promote the wise use of Montana's natural resources; (2) to protect the state's renewable resources through sound soil and water conservation, weed control, and other restoration programs; and (3) to provide research to assess past or potential environmental damage resulting from natural resource development.

RECOMMENDATION

A grant of up to $91,104 is recommended for this project contingent on DNRC approval of project scope of work and budget.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Elkhorn Improvements

GRANT AMOUNT REQUESTED: $5,000

TOTAL PROJECT COST: $5,000

PROJECT DESCRIPTION

The ghost town of Elkhorn lies northeast of Boulder in the Elkhorn Mountains. It receives about 1,800 visitors per year. Visitation is expected to increase.

This historic mining town has very little parking space available and parking is uncontrolled. The structures remaining need to be identified and the history explained to visitors, through installation of interpretive signs.

TECHNICAL FEASIBILITY ASSESSMENT

This project would include installed interpretive signs and an identified parking area. This project would be completed in the 1986-87 biennium.

FINANCIAL ANALYSIS

Total Project Cost		$5,000
Funding Sources	Amount	
1. Legacy	$5,000	
Total Funding Contributions		$5,000

The entire $5,000 budget would be allocated for construction costs: labor and materials.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated as a result of this project.

PUBLIC BENEFITS ASSESSMENT

This project would help protect a renewable resource in Montana, state recreational lands, and facilities. Primary benefactors of the project would be the visitors to the area.

RECOMMENDATION

A grant of up to $5,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC; and

2. that bids are approved by DFWP and DNRC.

APPLICANT NAME: Montana State University, Water Resources Research Center

PROJECT/ACTIVITY: Heavy Metal Contamination in the Clark Fork River Flood Plain and Impacts on the Biotic Resources of the River

GRANT AMOUNT REQUESTED: $91,590

TOTAL PROJECT COST: $91,590

PROJECT DESCRIPTION

The Water Center at MSU is involved in research relative to state and regional needs. The Water Center does not maintain a permanent research staff. Annual research programs are selected from proposals submitted by faculty members within the university system, and the research is conducted by those members. Priority research areas are identified and proposals are screened by an Advisory Council composed of the heads of the state water agencies, state and federal water agency personnel, and representatives from industry, consulting firms, environmental groups, and the general public. The Water Center provides the administrative framework for the program. It receives and disburses the funds, monitors the progress on the projects, and receives, prints, and disseminates the final reports. The principal source of Water Center funding has been federal appropriations of approximately $115,000 per year. The 48th Montana Legislature appropriated $30,000 of state funds for the 1984-85 biennium, and some matching dollars and in-kind services have been available through other state resources. In March 1984, Congress passed the Water Resources Research Act of 1984 that extends federal participation in the program through fiscal year (FY) 1989. This legislation authorizes funding of up to about $160,000 per year to the Water Center and requires a nonfederal match of one-to-one in the first two years, increasing to two-to-one nonfederal matching during the last two years.

MSU proposes to expand the research program of the Water Resources Research Center and to provide part of the state match required by the federal program through the use of legacy program funds. Because it is designed to blend with the federal program, the proposed project has been screened by members of the Advisory Council. This proposal will be integrated into FY 1985 and FY 1986 research programs along with the federally funded projects.

Large-scale mining and smelting activities have generated metal-contaminated waste tailings along the Upper Clark Fork River for the past century. The drainage was used for industrial waste disposal, and the water quality degradation adversely affected the biotic resources of the river. While efforts to control the sources of contamination have been somewhat successful, the upper river continues to show signs of stress, and fish populations remain below levels expected for a river with the Clark Fork's physical characteristics. Fish populations actually decline downstream of the main point sources of contamination. This decline may result from leaching of contaminants from deposition sources in the flood plain, or changes in the availability of methods due to changes in water quality conditions.

This proposal would delineate the extent, location, and quantity of diffuse metal sediments in the Upper Clark Fork riparian zone to provide a data base for managing the contamination source. It would also determine the significance of the fishery of these diffuse sources compared to the fishery at the point sources, to assess the benefits of the control and management of these two sources of metals.

TECHNICAL FEASIBILITY ASSESSMENT

There are eight objectives of this proposal:

1) Define the areal extent, severity, and location of toxic metal contaminated riparian sediments on the Clark Fork floodplain from the Kohrs Bridge to the Milltown Dam,
2) Estimate the volume of these contaminated sediments,
3) Evaluate the potential for sediments to re-enter the river by classifying reaches of the riparian zone as being:
   a) subject to active erosion,
   b) potentially active with channel relocations,
   c) isolated by construction (highways, railroads),
4) Determine the amount of metals transported through the upper river seasonally to identify reaches where diffuse sources appear to be significant,
5) Determine the relative amounts of dissolved and particulate metals in the above loads and relate these to water quality and quantity to explain the fate and significance of metals originating in the headwaters,
6) Evaluate the impact on the fishery of these two sources of metal contamination,
7) Make recommendations concerning the allocation of efforts to control metal sources in the headwaters versus diffuse sources downstream, and
8) Integrate objectives with Superfund projects, Water Quality Bureau, USGS, and DFWP studies.

Implementation of these objectives would result in products including river channel and flood plain maps showing areas lacking vegetation because of metal-contaminated sediments, locations of metal-tolerant plant communities, and the erosion potential of riparian deposits. Information would also be tabulated and a final report with recommendations would be produced.

Proposal reviewers suggest that the scope of this project be limited to accomplishing objectives 1 and 2 to avoid duplication of efforts with other studies, and work done by state agencies. Objectives 1 and 2 can be completed effectively within the biennium. Objectives 1 and 2 would provide usable and necessary information. The proposal should be coordinated through the Clark Fork Interagency Task Force to avoid duplication of efforts.

This proposal was not ranked by the Montana Water Resources Research Center because it was proposed only recently.

The proposal would be administered by MSU, and could be completed within the biennium.

FINANCIAL ANALYSIS

Total Project Costs		$91,590
Funding Sources	Amount	
1. Legacy	$91,590	
Total Funding Contributions		$91,590

Salaries and benefits for two principal investigators from the University of Montana Gordon Laboratory, a consultant, and seven assistants would total $67,144. Travel costs would be $2,586, and supplies and equipment maintenance costs would be $6,596. Indirect costs to MSU would be $15,265.

Cost estimates appear adequate and reasonable. Costs could be reduced substantially if the project scope is limited to objectives 1 and 2.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impact is anticipated from this proposal. Positive benefits may result if the project prompts action to reduce the heavy metal contamination of the Clark Fork River.

PUBLIC BENEFITS ASSESSMENT

The project would provide for research to assess past or potential environmental damage resulting from natural resource development.

Primary benefactors would be residents of the Clark Fork River Basin. All Montanans would benefit if the project results in action that reduces the heavy metal contamination of the Clark Fork River.

RECOMMENDATION

A grant of up to $91,590 is recommended contingent on DNRC approval of the project scope of work and budget. Before finalizing the study objectives, the project work plan must be coordinated with the Clark Fork Interagency Task Force.

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APPLICANT NAME: Fort Peck Tribal Council

PROJECT/ACTIVITY: Determine Extent of Ground Water Contamination in the East Poplar Oil Field

GRANT AMOUNT REQUESTED: $149,542

TOTAL PROJECT COST: $149,542

PROJECT DESCRIPTION

The East Poplar oil field is eight miles northeast of Poplar on the Fort Peck Reservation. Oil was discovered here in 1952. A 1982 study by the USGS confirmed that brine produced as a by-product in the production and recovery of oil in this field was contaminating the shallow alluvial aquifer. Several

farm and domestic wells in the area now yield unusable water and there has been some contamination of the Poplar River. The most likely sources of contamination are: unlined brine-holding pits; leaks in pipelines transporting brine, in well-head connections, and in injection well casing; and spills from holding tanks or holding pits.

This study would define the extent of the contamination as recommended in the USGS report:

"Additional data collection is necessary to determine the areal extent of contamination. Rates of movement of brine in the alluvium, geochemical reactions that may occur between the brine and alluvium resulting in precipitates, and changes in water quality with depth in the alluvium also could be determined by analysis of additional data."

TECHNICAL FEASIBILITY ASSESSMENT

The first phase of the project would be a reconnaissance-level study consisting of an inventory of existing wells and collecting water samples for chemical analysis, drilling and installing test wells in areas of sparse water-level data, conducting a seepage run on the Poplar River to determine its gaining or losing reaches and water-quality variations, and evaluating the data to identify potential point sources of contamination. The second phase would be site-specific study of contaminated areas identified in phase one. The work would consist of drilling additional test holes in areas of suspected point sources, conducting additional detailed seepage runs to pinpoint any areas where ground water inflow significantly affects the chemical quality of water in the Poplar River, using surface resistivity techniques to help derine the areal extent of contaminant plumes through the alluvial aquifer. The third phase of the study would be to evaluate various management alternatives designed to alleviate or halt the contamination.

FINANCIAL ANALYSIS

Total Project Costs		$149,542
Funding Sources	Amount	
1. Legacy	$149,542	
Total Funding Contributions		$149,542

Due to the short time frame for developing applications for the legacy program, there was not time to solicit cost share from the BIA or USGS.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would have positive environmental benefits if it led to the prevention of further contamination of the local aquifer and the Poplar River and if it led to the reduction of present damages.

PUBLIC BENEFITS ASSESSMENT

This project would provide benefits in the area of oil and gas reclamation. If the problem is addressed, benefits would accrue to local landowners and downstream users of Poplar River water.

RECOMMENDATION

A grant of up to $149,542 is recommended contingent on:

1. DNRC approval of the project scope of work and budget;

2. proven need for a full-time hydrologist;

3. no identification of a liable party who can reasonably be held responsible for this work; and

4. no availability of cost-share funds from USGS and/or BIA.

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APPLICANT NAME: Powder River Conservation District

PROJECT/ACTIVITY: Powder River Irrigation Water Quality Study

GRANT AMOUNT REQUESTED: $80,000

TOTAL PROJECT COST: $87,500

PROJECT DESCRIPTION

The Powder River Conservation District proposes to sponsor a two-year study to estimate the effects of a decrease in water quality or availability on crop yields in Montana's Powder River Basin. Water quality and quantity have become issues to Powder River area irrigators as a result of saline discharges from Wyoming's Salt Creek oilfield and proposed new water development in Wyoming.

The purpose of the project would be (1) to provide baseline data regarding the quality of irrigation water in the Powder River through water sampling and analysis, and (2) to estimate how an increase in total dissolved solids or a decrease in water supply would affect crop yields.

Documentation resulting from this study would be necessary to support Montana's position in future negotiation of Yellowstone Compact issues and to provide impetus for intervention by EPA to help resolve water quality problems presently existing in the Powder River.

TECHNICAL FEASIBILITY ASSESSMENT

This study has three phases:

Phase I - Water Quality Monitoring

This phase would include development of an irrigation water monitoring program in which 100 samples would be analyzed during each irrigation season. The cost of analysis would be about $100 per sample.

Phase II - Literature Search

During Phase II, the staff would research the literature, analyze existing data and summarize the findings. This part of the study would be funded entirely by House Bill 223 funds administered by the Conservation Districts Division ($7,500 in the budget).

Phase III - Collection and Analysis of Crop Yield Data and Analysis of Impact

Experimental plots would be selected which would represent typical soils, crops, irrigation schedules, and harvest times in the Powder River Basin. These plots would be treated with different TDS levels and composition. The crops would then be measured for total biomass and nutrient content.

The project could be completed within the biennium. However, the project sponsor would continue Phases I and III for an additional two years if funding could be secured for the next biennium.

FINANCIAL ANALYSIS

Total Project Costs		$87,500
Funding Sources	Amount	
1. Legacy	$80,000	
2. DNRC 223	7,500	
Total Funding Contributions		$87,500

Phase II of this study would be funded by DNRC 223 funds. Phases I and III together would cost $80,000, or $40,000 each year.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated as a result of this project. The long-term effects of the study would be positive for the water quality of the Powder River.

PUBLIC BENEFITS ASSESSMENT

More than 35,000 acres are irrigated from the Powder River in Montana. The State of Montana feels that these agricultural uses of water need to be protected from degradation of water quality by upstream development in Wyoming. Although the Powder River irrigators would be the primary beneficiaries of this project, the general public of Montana would benefit by protecting Montana's water and sustaining a strong agricultural industry in the state.

RECOMMENDATION

A grant of up to $80,000 is recommended for this project contingent on the following conditions:

1. the project sponsors demonstrate that a viable product can be obtained in two years;

2. the need for Phase III of the study be approved by DNRC subsequent to completion of a comprehensive search for existing information under Phase II of the study;

3. the project sponsor coordinate the study effort with the Water Quality Bureau and the MSU Cooperative Extension Service; and

4. the study plan, scope of work, and budget be approved by DNRC.

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APPLICANT NAME: Teton County Conservation District

PROJECT/ACTIVITY: Upper Teton Water Conservation Study

GRANT AMOUNT REQUESTED: $212,660

TOTAL PROJECT COST: $212,660

PROJECT DESCRIPTION

Varied demands have been placed on the ground water resource of the Upper Teton Aquifer and the Teton River. Because of lack of information about the river, management of the water resource in this area is on a crisis-by-crisis basis. Agricultural irrigators are accused of overuse and poor efficiencies by domestic users in Choteau, property owners are denied permission to irrigate from wells, and a portion of the Teton River is completely dewatered.

There are five major irrigation canal companies as well as numerous private irrigation systems that divert water from the Teton River or storage reservoirs above Choteau. The City of Choteau also relies on ground water indirectly supplied by irrigation water recharge of the Teton River-Spring Creek alluvial aquifer. Yet the total water diversion rates are not accurately known; canal delivery efficiencies are not quantified and actual water applications to fields are not measured. Canal system losses may be beneficial to ground water recharge or may cause undesirably high water tables. The location of recharge and problem areas, however, is not now identified in a consistent manner throughout the area. The mechanism and rates of recharge to City of Choteau wells are not known.

Adequate water supplies for both domestic and irrigation uses in the Choteau area are scarce, and three drought years in a row (1982-84) have worsened the problems. A number of law suits, hearings, and legal actions have occurred or are in progress concerning water rights and disputes among water users.

Crop water use rates, precipitation amounts and distribution, and potential evapotranspiration rates are not well known for this area. The large irrigation reservoirs such as Bynum and Eureka probably play a

significant, but yet undocumented role in the overall water budget. Sound management practices of the entire water resources inventory are necessary if the agricultural and municipal communities are to survive in harmony. The stability of the water resource is the essence for the continuation of prime wildlife habitat and the excellent diverse recreational facilities provided within the area.

The hydrologically complex nature of the aquifer makes it necessary to understand the recharge-storage-discharge capacities before competent judgements can be reached as to the alternatives available in the resource management. The Teton County Conservation District, with technical assistance from the Montana Bureau of Mines and Geology, proposes to develop a total water budget assessment for the development of a water conservation-water use plan of the area. This project will provide the surface water, irrigation, crop use and meteorological data to complement the ground water hydrological study proposal submitted for funding to the Water Development Program.

The lack of specific water resource information for this major irrigated area in the state is the key problem which will be solved by implementation of this proposal along with the Water Development proposal.

The study area encompasses the irrigated benchland from Choteau, north to the Bynum canal, east to Collins and west along the Teton River and Muddy Creek valleys to the mountain front.

TECHNICAL FEASIBILITY ASSESSMENT

The study approach would be to measure all major components of the hydrology of the study area at selected sites over one year. One central meteorological station would be installed in the project area for measuring precipitation. All major irrigation water diversions would be monitored near the Teton River at existing structures wherever possible. At least one of the major canals would be gaged along its length to determine gains or losses in flow. Seepage meters may be installed in the bed of the canal, or canal ponding tests conducted near the end of the irrigation season. A canal inventory throughout the study area would be conducted to establish total canal length, geometry and operating conditions. This would permit an estimate of total canal seepage loss to be made. Surface water return flow would be measured in Spring Coulee, Camble Coulee, the Brady Canal, and Muddy Creek. On-farm irrigation efficiency and water balance investigations would be conducted on three or four representative fields in the water table portion of the study area. Irrigation water inflows to fields would be measured, pre- and post-irrigation soil moisture conditions assessed, and evapotranspiration and ground water recharge would all be measured concurrently. Existing wells would be used whenever possible; however, it would probably be necessary to drill two or three wells per site to monitor the water table response to irrigation. Domestic well inventories would be conducted throughout the study area on a quarterly basis to determine the overall change in water table configuration and ground water storage. Water quality samples would be collected from selected domestic wells to aid in flow system interpretations.

All data would be organized, tabulated, presented graphically, and interpeted in a final report. An overall hydrologic budget for the study area would be produced. Canal system efficiencies, on-farm irrigation efficiencies, surface-water runoff, and ground water recharge and runoff would be quantified and inter-related. Recommendations for irrigation water management and ground water use would be presented.

The products of this project would be the scientific data base and interpretations relating to the hydrology and irrigation/domestic water supply situation of the study area. The data and interpretations would be presented in a final report published by Montana Bureau of Mines and Geology (MBMG), but also disseminated through public meetings, individual consultation, and the media.

Much of the raw hydrologic data would be digitized and available to state agencies or others as computer-coded information or processed output, such as hydrographs, tables or graphics. All data would become part of the Bureau's state-wide ground water data base.

The network of gaging stations and observation wells would remain, to be available for continued use in water management operations.

MBMG would provide professional and technical work and drilling and logging would be contracted work. The project could be completed in two years.

The need for the study and the controversy in the area is evident. The project could help solve some major pending legal disputes and prevent new ones. As the single largest water user in Montana, agriculture has much to gain from hydrologic research into the basic mechanisms of water supply systems, irrigation efficiency, crop water use, and interaction with meteorologic and geologic factors. In addition, other potential water users stand to gain, because more efficient agricultural use may allow water for expansion of irrigation, use of return flows by other industries, maintenance of instream flows, or replenishment of ground water supplies. Results from this project would be applicable to much of the irrigated land all along the Rocky Mountain Front.

The proposal may overlap and duplicate some areas of the proposal submitted to the Water Development Program, but generally they complement each other and provide a more thorough assessment.

FINANCIAL ANALYSIS

Total Project Cost		$212,660
Funding Sources	Amount	
1. Legacy	$212,660	
2. Applicant	-0-	
Total Funding Contributions		$212,660

Administration costs by Teton Conservation District would be $900. Personnel salary and travel costs would total $105,480 for a hydrologist, soil scientist, technicians, and assistants. Drilling, gaging stations, equipment, and publication costs would be $54,590. Indirect costs to the applicant, contingency, and inflation costs would amount to $51,690. Cost estimates appear high given that there may be some duplication with the proposal submitted to the Water Development program. Neither the applicant nor MBMG is contributing funds to the project, nor have they requested matching money from the U.S. Geological Survey, which often contributes to these types of projects.

ENVIRONMENTAL IMPACT ASSESSMENT

Continued unplanned development of the water resource in this area could result in water shortages, depletion and dewatering that would have severe long- and short-term adverse environmental impacts to public health, land quality, vegetation, and fish and wildlife. Information from this study could be used to make management decisions that will prevent these adverse effects and would then provide long-term positive impacts to the environment. Well drilling and construction could cause some adverse environmental impacts, but they would be short-term and minimal.

PUBLIC BENEFITS ASSESSMENT

This proposal will provide for mitigation of economic impacts from natural resource development and would provide for technical assistance to promote the wise use of Montana's natural resources through water conservation. Primary benefactors would be residents of Choteau and the surrounding agricultural community. Montana citizens may benefit if the quantity and quality of the water in the Teton River are improved.

RECOMMENDATION

A grant of up to $212,660 is recommended contingent on DNRC approval of the project scope of work and budget. The project must include monitoring to address concerns of the City of Choteau. Total grant contributions from the water development and legacy programs must not exceed $212,660.

APPLICANT NAME:	Montana State University, Water Resources Research Center
PROJECT/ACTIVITY:	Chemistry Controlling Copper Availability and Transportation in the Upper Clark Fork River
GRANT AMOUNT REQUESTED:	$24,834
TOTAL PROJECT COST:	$24,834

PROJECT DESCRIPTION

The Water Center at MSU is involved in research relative to state and regional needs. The Water Center does not maintain a permanent research staff. Annual research programs are selected from proposals submitted by faculty members within the university system, and the research is conducted by those members. Priority research areas are identified and proposals are screened by an Advisory Council composed of the heads of the state water agencies, state and federal water agency personnel, and representatives from industry, consulting firms, environmental groups, and the general public. The Water Center provides the administrative framework for the program. It receives and disburses the funds, monitors the progress on the projects, and receives, prints and disseminates the final reports. The principal source of Water Center funding has been federal appropriations of approximately $115,000 per year. The 48th Legislature appropriated $30,000 of state funds for the

1984-85 biennium, and some matching dollars and in-kind services have been available through other state resources. In March of 1984, Congress passed the Water Resources Research Act of 1984, which extends federal participation in the program through fiscal year (FY) 1989. This legislation authorizes funding of up to about $160,000 per year to the Water Center and requires a nonfederal match of one-to-one in the first two years, increasing to two-to-one nonfederal matching during the last two years.

MSU proposes to expand the research program of the Water Resources Research Center and to provide part of the state match required by the federal program through the use of legacy program funds. Because it is designed to blend with the federal program, the proposed project has been screened by members of the Advisory Council. This proposal will be integrated into FY 1985 and FY 1986 research programs along with the federally funded projects.

Sizeable mining and smelting activities in the Upper Clark Fork River Basin, which started in the late 1800s, have resulted in extensive copper pollution and, consequently, biotic stress. Before 1954, the mining waste water streams flowed directly to the Clark Fork River. The consequence was significant contamination of the upper river and the stream beds. During the 1950s, a series of settling ponds was constructed to receive the water from the contaminated streams. Under ideal conditions, these ponds are very successful in reducing the amount of copper transported. Conditions are not always ideal, however, and these ponds continue to be sources of heavy metal-pollution for the river. Recent studies have indicated that sizeable amounts of copper move from the river bed sediments, particularly in the Warm Springs to Deer Lodge region. Montana State University (MSU) proposes to determine how and why this is occurring, and to be able to predict when it will occur in the future.

TECHNICAL FEASIBILITY ASSESSMENT

Sources of copper currently found in the Upper Clark Fork River would be identified through chemical monitoring of the river and the tributary streams. River bed sediments would be identified and analyzed for copper, and the rate and the mechanism for the release of copper from these sediments would be established.

Mechanisms for copper transport in the Upper Clark Fork River would be identified to establish the distribution of copper between soluble, complex and absorbed species. In addition, hourly, daily, and seasonal variation would be established.

A model to predict future copper concentrations if no remedial action is taken would be developed. These predictions should provide the information needed to develop reclamation procedures that would minimize copper in the Upper Clark Fork River. This project was started in August of 1984 with Montana Water Resources Research Center Advisory Council funds. This proposal would continue it.

This project was ranked sixth of 16 proposals reviewed by the Montana Water Resources Research Center Advisory Council.

There may be some overlap or duplication with other heavy-metal studies of the Clark Fork, but these can be eliminated through coordination with other project sponsors. Information on copper toxicity, copper speciation and mobilization is needed, and this study could provide the information.

The project could be completed in two years.

FINANCIAL ANALYSIS

Total Project Costs		$24,834
Funding Sources	Amount	
1. Legacy	$24,834	
Total Funding Contributions		$24,834

Of the $24,834, salaries comprise $17,220, and travel costs would be $1,500. Chemical supply costs would total $2,000 and indirect costs to MSU would add $4,114 to the total.

Cost estimates appear reasonable and adequate to meet project objectives. MSU would administer the funds.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts would result from this proposal. Positive benefits may result if the project prompts action to reduce the copper contamination of the Clark Fork.

PUBLIC BENEFITS ASSESSMENT

This project would provide research assessing past or potential environmental damage from natural resource development. Primary benefactors would be residents of the Clark Fork River Basin. All Montanans would benefit if copper impacts to the Clark Fork River system are reduced or controlled.

RECOMMENDATION

A grant of up to $24,834 is recommended contingent on DNRC approval of the project scope of work and budget. Before finalizing the study objectives, the project work plan must be coordinated with the Clark Fork Interagency Task Force.

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APPLICANT NAME: Montana Department of Health and Environmental Sciences; Water Quality Bureau

PROJECT/ACTIVITY: Forest Land Watershed Improvement Program

GRANT AMOUNT REQUESTED: $55,000

TOTAL PROJECT COST: $55,000

PROJECT DESCRIPTION

Logging, road building, oil and gas exploration, and associated activities on forest lands have created a variety of pollution problems in many areas of Montana. The most pronounced environmental impact of such activities is degradation of water quality. Several areas of the state have continuing water quality problems such as excessive sedimentation, high turbidity levels,

and high phosphorus loads as a result of forest land activities. The Flathead River drainage above Flathead Lake is an area that is seriously affected by such activities and is of great concern to area residents and to those agencies responsible for protection of water quality in the drainage.

The project would fund rehabilitation work such as stream-channel stabilization, erosion control, road stabilization, and reforestation on priority affected forested watersheds. The applicant would establish site selection criteria with emphasis placed on sites that have severe water quality conditions affecting downstream beneficial uses. Some before and after water quality monitoring would likely be undertaken at selected sites.

TECHNICAL FEASIBILITY ASSESSMENT

Technical feasibility is difficult to assess unless site-specific details are given on such items as types and magnitude of problems and proposed rehabilitation plans. In principal, however, forest land watershed rehabilitation projects can certainly be both technically feasible and effective. Accurate rehabilitation costs would, of course, also be site-specific and could only be determined following completion of rehabilitation plans. At this point, given the lack of specific information on individual sites and required rehabilitation activities at each site, there is no way to determine if the estimated project cost is sufficient to complete several sites, only one site, or possibly only a portion of one site. In general, the estimated costs appear to be quite low for even one large rehabilitation project. Therefore, care would have to be taken to choose a site or sites that can, in fact, be rehabilitated with the amount of funds received.

FINANCIAL ANALYSIS

Total Project Costs		$55,000
Funding Sources	Amount	
1. Legacy	$55,000	
2. Applicant	-0-	
Total Funding Contributions		$55,000

The applicant has indicated that no money would be used for their administration of the contract and, therefore, the grant would be used for professional services and construction. The contract administration portion of the project budget would be for the administrative expenses of a sponsor of a specific site. The budget includes $5,000 for contract administration, $10,000 for professional and technical costs, $31,200 for construction costs and $8,800 for contingencies.

ENVIRONMENTAL IMPACT ASSESSMENT

Net positive environmental impacts would result from this project. No significant adverse environmental impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

The project would provide rehabilitation of areas damaged by natural resource development on forest lands and protect the state's renewable resources through conservation of soil and water. The primary beneficiaries would be the people of Montana and specifically the water users located downstream from selected sites. Improvement in water quality and soil conservation would provide compensation for the projected costs.

RECOMMENDATION

Conceptually, this project is certainly of value and meets the intent of the legacy program. A grant of up to $55,000 is recommended contingent on DNRC approval of a specific site or sites, the rehabilitation methods to be used, and the scope of work and budget. This would be for demonstration project(s) in hope that other such projects would be proposed to the legacy program.

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APPLICANT NAME: Montana State Library

PROJECT/ACTIVITY: Natural Resources Information System Natural Heritage Program

GRANT AMOUNT REQUESTED: $472,639

TOTAL PROJECT COST: $472,639

PROJECT DESCRIPTION

Private business, citizen groups, research firms, state and federal agencies, and private individuals rely on natural resource information for wise decision making. Data on Montana's natural resources is collected for different purposes and stored in a variety of ways. This may result in delay in locating and retrieving the data and in duplication of existing data. As information is collected, access to the basic data about natural resources may be handicapped through increased complexity. The efficiency of using data already collected may be reduced.

The proposed project consists of two separate but coordinated programs--the Natural Resource Information System (NRIS) and the Natural Heritage Program. The NRIS would be a centrally located catalog, index. and referral to existing natural resource data files and reports. This system would permit government and private-sector users to readily identify the location, source, and types of information available in state agency files. The second program, the Natural Heritage Program, would provide a systematic inventory and evaluation of the state's natural features that are rare, endangered, or fragile. This program would fill a void in the state's existing natural resource data base. Although the program objectives differ, their operations can be centrally coordinated within the State Library.

TECHNICAL FEASIBILITY ASSESSMENT

A lead person would serve as the NRIS coordinator and as contract administrator for the Natural Heritage Program. The primary responsibility of the NRIS coordinator would be to develop a first-level NRIS index and referral service. An audit of natural resource data files would be conducted to identify and catalog data existing in state agency files. A referral service would be established to serve all entities that use natural resource data. The NRIS would publicize its activities and services so that potential users are aware of its existence. Responsibility of collection, evaluation, and storage of data would remain with the appropriate state agencies.

A second objective of the NRIS is to make recommendations on how data handling can be improved; for example, how to minimize duplication of data collections, reduce costs of data collections and data retrieval, and minimize the loss of data due to project and personnel turnover. Recommendations made by experienced NRIS personnel are expected to result in a flexible, evolving system that could take advantage of new technology as it becomes practical.

The Natural Heritage program would provide an inventory of significant elements of a state's natural features that are exemplary, rare, or endangered at the state or national level. These elements include plant and animal species, plant communities, aquatic systems, critical habitats, and other ecological features of significant importance.

Typical heritage programs in other states have been established under a contractual arrangement between state government and the Nature Conservancy. Since 1974, Natural Heritage programs have been launched in 30 states.

FINANCIAL ANALYSIS

Total Project Costs		$472,639
Funding Sources	Amount	
1. Legacy	$472,639	
Total Funding Contributions		$472,639

The budget appears adequate to complete the project as proposed for the first two years. This project would take four years to completely set up and would then need to be updated and information provided to users.

An alternate source of partial funding would be the Nature Conservancy, which is frequently involved in and contributes to Natural Heritage programs in other states.

ENVIRONMENTAL IMPACT ASSESSMENT

This project should have positive environmental impacts in that it would prepare for the efficient use of natural resource data so that wise natural resource decisions can be made.

PUBLIC BENEFITS ASSESSMENT

This proposal would potentially provide benefits in several legacy categories by:

1) facilitating the identification of recreational areas or natural areas to compensate for losses caused by past or future resource extraction;

2) providing for research allowing the wise use of Montana's natural resources and to make processing more environmentally compatible; and
3) providing for research demonstration to assess past or potential environmental damage resulting from natural resource development.

RECOMMENDATION

A grant of up to $472,639 is recommended contingent on the following:

1. DNRC approval of project scope of work and budget;

2. no new permanent full-time employees (FTEs) would be created; these funds would be used for start-up costs related to this program. This work would be contracted or temporary FTEs would be used; and

3. the State Library would assume funding responsibility for the provision of services under this program and its updating because the legacy program would not be a long-term funding source.

APPLICANT NAME: Bitterroot Conservation District

PROJECT/ACTIVITY: Demonstration of Savory Grazing Management for Weed Control

GRANT AMOUNT REQUESTED: $6,500

TOTAL PROJECT COST: $6,500

PROJECT DESCRIPTION

The purpose of this project is to demonstrate the effectiveness of intensive grazing management as a noxious weed control method on rangeland.

The objective of the project is to control spotted knapweed (Centaurea maculosa) on 1,200 acres of rangeland in Ravalli County, Montana. Control of this noxious weed would increase forage and livestock production, improve the ecological range condition, enhance wildlife habitat, and reduce soil erosion.

TECHNICAL FEASIBILITY ASSESSMENT

A cooperative approach would be required to accomplish the objective. Agency personnel from the Soil Conservation Service (SCS), Department of Natural Resources and Conservation (DNRC), Department of State Lands (DSL), and Montana State University (MSU) will coordinate an intensive range survey that would function as baseline data. Range condition and initial stocking rates would be determined by SCS grazing studies. Data on weed densities, shrub canopy cover, evidence of erosion, percent ground cover, and range trend would be estimated. This baseline data would be used to document range conditions, existing management, and to determine stocking rates using "time controlled grazing" as applied by the Savory Grazing Method (S.G.M.--also referred to as Holistic Resource Management). The rancher would be required to attend the Savory Grazing School and to work with trained SCS, DNRC, and University Range Conservationists.

Detailed monitoring of range ecosystem response to intensive grazing management would be carried out for five years. The same data collection process used in the baseline study would be repeated each year. The rancher's daily observations of range condition required to successfully implement S.G.M. would supplement this intensive range survey. Weekly visits from agency personnel would document these observations.

The ranch owners would be responsible for the daily operation of this grazing unit including livestock moves, animal husbandry, fence maintenance, and recordkeeping.

FINANCIAL ANALYSIS

Total Project Costs		$6,500
Funding Sources	Amount	
1. Legacy	$6,500	
Total Funding Contributions		$6,500

The cost for any additional manpower to implement and manage this system will be borne by the ranch.

ENVIRONMENTAL IMPACT ASSESSMENT

If this system is successful, it will have the positive impact of controling weeds.

PUBLIC BENEFITS ASSESSMENT

If successful, this method could be used by other ranchers with weed-control problems.

RECOMMENDATION

A grant of up to $5,000 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Gartside Dam Repair

GRANT AMOUNT REQUESTED: $450,811

TOTAL PROJECT COST: $550,811

PROJECT DESCRIPTION

Gartside Dam is an earthfill facility located on Crane Creek ten miles southwest of Sidney in Richland County. The project is owned and operated by the Department of Fish, Wildlife and Parks (DFWP) and has been used primarily

for recreation. DFWP has requested legacy program grant funds for the construction of major improvements and repairs needed to operate the dam safely.

The embankment holds 236 acre-feet of water with a surface area of 36 acres. The dam has been repaired and raised a series of times since the early 1900s. The U.S. Army Corps of Engineers identified major dam safety issues and questions in their November 1980 evaluation of Gartside Dam. In 1982, a large depression formed around the water inlet structure, causing major concern over the stability of the embankment. Engineers recommended that water levels in the reservoir be kept at a minimum until repairs are made.

DFWP obtained a $100,000 grant from the Water Development Program in 1983 to begin rehabilitation of the dam. An engineering consultant has analyzed the improvement alternatives, and a final option has been selected. The engineer is currently preparing construction plans and specifications so construction can begin if funds are acquired.

TECHNICAL FEASIBILITY ASSESSMENT

Gartside Dam is considered an intermediate-sized facility with a significant downstream hazard potential based on potential property damage and loss of life that could result if the dam failed. The dam is considered unsafe because the facility can handle only a portion of the design flood without overtopping and causing failure. In addition, the outlet works is in poor condition, causing serious concern about the ability to hold even small amounts of water.

The U.S. Army Corps of Engineers pointed out serious dam safety concerns and recommended additional investigations in their Phase 1 dam safety evaluation of the dam in 1980. DFWP subsequently obtained funding for an engineering evaluation and design of needed improvements. The project engineer has completed an analysis to identify the rehabilitation needs for Gartside Dam. The rehabilitation needs are: to control seepage, increase stability of the downstream face, provide upstream slope protection, replace the outlet structure, and upgrade the auxiliary spillway to pass one-half of the probable maximum flood. Cost estimates for a series of construction alternatives were prepared by the consultant and the design of selected improvements is currently underway. The proposed improvements appear to satisfy the rehabilitation needs. The project could be completed in one construction season after funding has been obtained.

FINANCIAL ANALYSIS

Total Project Costs		$550,811
Funding Sources	Amount	
1. Legacy	$450,811	
2. DNRC Water Development	100,000	
Total Funding Contributions		$550,811

ENVIRONMENTAL IMPACT ASSESSMENT

The construction effects associated with the dam rehabilitation would include: short-term decreased water quality to Crane Creek, vegetation loss in barrow areas, and typical noise as well as air-quality reduction during construction. Most impacts would occur within the existing project area. Final impacts should be assessed and all permits acquired during the design phase. Completion of the project would improve the area for recreation, fish, and water fowl.

PUBLIC BENEFITS ASSESSMENT

The proposed project would primarily benefit residents in the Sidney-Fairview-Glendive area. Major benefits would include fish and wildlife enhancement, provision of recreational opportunities, improved water quality, and preserving an agricultural water supply. Rehabilitation of the dam would also remove the life and property loss hazard attributed to the unsafe dam.

Recreationists made over 25,000 visits to the area between May and September of 1981.

RECOMMENDATION

A grant of up to $450,811 is recommended contingent on DNRC approval of the project construction plans, specifications, and final project cost estimate.

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APPLICANT NAME: University of Montana

PROJECT/ACTIVITY: Mitigation of Impacts of Natural Resource Development to the Montana Beekeeping Industry

GRANT AMOUNT REQUESTED: $135,132

TOTAL PROJECT COST: $135,132

PROJECT DESCRIPTION

The University of Montana, through its Departments of Zoology and Botany, proposes a demonstration project that will use data from bee tissue and pollen samples along with water samples to map the dispersion of toxic chemicals, specifically arsenic, cadmium, and copper, in the Deer Lodge and Helena valleys. The University would also like to acquire the capability, through a proposed contingency fund, to map dispersion in other contaminated areas. The mapping is intended to assist beekeepers locate apiaries and to form the basis of an environmental monitoring system. The beekeeping industry is described in the proposal as annually producing honey and wax with a wholesale value of $6.4 million. Pilot efforts to identify and locate pollutants took place in the Helena Valley in 1981. However, the Deer Lodge Valley has continued to be the most severe problem area for apiaries despite the smelter closing.

Using honey bees to develop a data base for an environmental monitoring system has been a ten-year effort at the University. Honey bees were selected for the monitoring program because they give an early warning of pollutant

bioavailability and accumulation. They also forage widely, providing a spatially integrated sample. This proposal for legacy would use the data collection and analysis procedures developed during this period along with a statistical procedure called kriging to develop maps that illustrate the dispersion of selected chemicals in the Deer Lodge and Helena valleys.

TECHNICAL FEASIBILITY ASSESSMENT

Phase I of the proposal would focus on the Deer Lodge Valley. Forager bees from at least 40 locations would be sampled during the spring, summer, and fall foraging seasons. Sites would be selected throughout the valley. Pollen and water would be sampled at all sites during the mid-summer sampling period. The samples would be processed at the Gordon Environmental Laboratory which has been set up to process environmental samples for heavy metals. Kriging would be used to summarize the data on a series of maps. The technique is considered uniquely suited for this purpose because data collection points do not have to fit any predetermined grid. It is a weighted moving average technique that enables mapping areas as large as 7,500 square kilometers. The Deer Lodge Valley map would illustrate arsenic, cadmium, and copper contamination. Phase II of the proposal would concentrate on a mid-season sampling in the Helena Valley in areas farther than 20 kilometers from the East Helena smelting complex. Closer sites were surveyed in 1981. Both maps would illustrate dispersion and the severity of the contamination. Phase III would provide a fund to respond to emergency threats to the beekeeping industry. The University expects that these maps could be used as management tools for the beekeeping industry, help to establish priorities for toxic waste cleanup, and provide information about the extent of contamination from pollution sources. The methodology is sound and has been supported by experts in the field.

FINANCIAL ANALYSIS

Total Project Costs		$135,132
Funding Sources	Amount	
1. Legacy	$135,132	
2. Applicant	-0-	
Total Funding Contributions		$135,132

The total project cost has been requested from the legacy program. The Gordon Environmental Laboratory would provide data analysis facilities with technician salaries provided from the legacy grant. The budget for the Phase I work is $77,154--$44,052 in salaries, $20,243 for travel, supplies, and mapping, and 20 percent or $12,859 for indirect costs to the University. The Phase II budget is $45,810--$25,291 for salaries, $12,884 for travel, supplies, and mapping, and $7,635 for indirect costs. The Phase III contingency fund budget is $12,168 and is allocated to the same budget categories. The budget appears adequate.

ENVIRONMENTAL IMPACT ASSESSMENT

This proposal will have no impacts on the environment. However, if the products are used as anticipated, they could contribute to decreasing negative environmental impacts from natural resource development.

PUBLIC BENEFITS ASSESSMENT

The beekeeping industry could benefit from the proposal if the maps are used to change the location of endangered apiaries. The general public could benefit from a program to reduce the existing contamination illustrated by the maps and a program to reduce or eliminate the contaminants at the source.

RECOMMENDATION

A grant of up to $61,482 is recommended for this project contingent on DNRC approval of the project scope of work and budget. This would fund 50 percent of the scope of work developed from the proposed Phase I or Phase II activities. The project sponsor would have to provide the other 50 percent. The Phase III contingency fund is not recommended for funding.

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APPLICANT NAME: Triangle Conservation District

PROJECT/ACTIVITY NAME: Expanded State Salinity Program

GRANT AMOUNT REQUESTED: $ 707,790

TOTAL PROJECT COST: $1,007,790

PROJECT DESCRIPTION

The Triangle Conservation District (TCD), an organization of 11 conservation districts north of Great Falls, operates a program of technical field assistance designed to correct saline seep problems and reclaim land on a farm-by-farm basis.

The district has been in operation for five years and because of its success in the Triangle Area, is proposing to expand to a state-wide program that would aid 33 counties in the treatment of saline seep.

Saline seeps are recently developed low-volume springs caused by a change in land use, predominantly from native perennial vegetation to the alternate crop-fallow dryland cropping system. The saline seep, or discharge area, is actually a result of inefficient use of annual precipitation in the up-slope or recharge area. Because of saline seep, over 280,000 acres of formerly productive cropland have been taken out of production; much of that land has been reclassified to a lower taxable value. In addition to the loss of annual cash crops, the degradation of both surface and ground water, which affects the public, is perhaps more severe. The salinity of the water, for example, may be as high as that of sea water. While reclamation of the surface soils has been documented, the reversal of the ground water quality to usable values may not occur within our lifetime. Therefore, the prevention of saline seeps is just as important as reclamation of existing ones.

The TCD technical field team has developed a proven technique to work on a farm-by-farm basis to achieve saline seep prevention and reclamation using state-of-the-art methods of recharge area identification, intensive cropping, and reclamation techniques. In the five years the TCD has been working on the problem, 204 individual reclamation plans have been developed to work on 6,659 acres of seep. The implementation rate has been 84 percent, a very impressive rate considering the increased costs and management necessary for the cooperators.

TECHNICAL FEASIBILITY ASSESSMENT

Over the last 10 years, saline seep research in Montana and the northern Great Plains has found that saline seep is the result of widely accepted farming practices developed over the last 40 to 50 years. The alternate crop-fallow method contributes to an accumulation of excess soil moisture that eventually becomes salinized and results in saline seep.

Simply stated, the solution to saline seep is to use the available moisture as it occurs, through vegetative growth; this would eliminate excess soil moisture and shallow ground water. Flexible intensive cropping practices and the use of permanent vegetation such as alfalfa are effective in the control and reclamation of saline seep areas. This method replaces the drainage approach, which simply transferred the problem of contaminated water elsewhere.

In the TCD program, areas of moisture recharge--the areas contributing to the seep formation--are identified with the use of a drill rig. The landowner is offered recommendations concerning soils, the extent of recharge area, USDA farm program requirements, marketing, weed problems, etc., which allow a site-specific method of saline seep control.

The cause and control of saline seep are presently well understood; the TCD team is working with landowners to help them fully understand the specific problems on their farms, and to modify their particular farming systems in order to find a workable solution to the seep problem.

FINANCIAL ANALYSIS

Total Project Cost		$1,007,790
Funding Sources	Amount	
1. Legacy	$707,790	
2. Applicant	200,000	
3. Water Development Program	100,000	
Total Funding Contributions		$1,007,790

The request is for $707,790 of a total budget of $1,007,790. This would enable the TCD to make a state-wide effort with three technical teams in the Triangle, the northeast, and southcentral areas of the state. Approximately 33 counties would be involved.

The landowners are now paying about one-third of the costs of the treatment on their lands. They also monitor wells in the seep area and provide the data to the technical team so that the effects of these treatments can be documented.

ENVIRONMENTAL IMPACT ASSESSMENT

Correcting saline seep problems is the first priority of conservation districts in the Triangle area. Seep lands are totally unproductive and this treatment, through crop management, has begun to return these lands to production. Saline seep has also been identified as a major contributor to salinization of surface and shallow ground water resources in Montana and the northern Great Plains.

PUBLIC BENEFITS ASSESSMENT

The proposed project would have several benefits, including water and land conservation.

Primary benefits, received by the agricultural sector, would include: significant reductions in crop and livestock losses, increased revenues, higher property values, erosion control, preservation of water quality in wells and stock ponds, and dissemination of information necessary for farmers and ranchers to implement effective farming practices.

RECOMMENDATION

A grant of $150,000 is recommended for this project. These funds are to be used for capital costs for the two new field offices. These funds are contingent on the Triangle Conservation District obtaining sufficient funds for salaries and travel to efficiently utilize this equipment. DNRC must also approve project scope of work and budget.

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APPLICANT NAME: Deer Lodge and Silver Bow Counties

PROJECT/ACTIVITY: Acquire Lands for Public Recreation at Georgetown Lake

GRANT AMOUNT REQUESTED: $1,613,333

TOTAL PROJECT COST: $1,613,333

PROJECT DESCRIPTION

In 1894, the Bi-metallic Mining Company of Philipsburg built a small dam on Flint Creek about 18 miles west of Anaconda, forming Georgetown Lake. In 1900 or 1901, the Anaconda Copper Mining Company purchased this dam for winter water needs at their copper smelter in Anaconda. The powerhouse was constructed below the dam in 1901 to supplement the available power in the area. The impoundment was enlarged in 1919 by adding five feet to the dam; in the 1940s, the dam was strengthened so that the water level could be raised another three feet.

The above activities created an impoundment containing 30,578 acre-feet of water at 6,429.5 feet elevation with a surface area of 2,768 acres or 4.5 square miles. The maximum depth is 38 feet. Only ten percent of the lake is over 25 feet deep and the average depth is 11 feet. The shallowness of the lake results in excellent fish production.

Outdoor recreation is a predominant use of both the lake itself and its immediate environment. The primary users are individuals from nearby mining communities. Recreation includes fishing, boating, water skiing, camping, picnicking, hiking, snowmobiling, cross country skiing, and sightseeing, among others.

There are four commercial marinas operating at the lake. The U.S. Forest Service maintains four improved campgrounds with accomodations for about 800 people. The improved areas are not adequate to accommodate use, at peak periods, so considerable camping is done in unimproved areas of public and private lands where facilities are very limited or nonexistent.

The Anaconda Minerals Company owns about one-half of the total shoreline, including over 1,300 acres of land in five parcels. The company has previously sold lots to private owners for cabin or home sites but now wishes to dispose of its entire holdings. This proposal is to purchase 447 acres having about two miles of shoreline to guarantee public access to the waters of Georgetown Lake and its shoreline.

TECHNICAL FEASIBILITY ASSESSMENT

The need to preserve for public use a section of Georgetown Lake is self-evident with the demands of private individuals to purchase lake frontage properties.

Anaconda Minerals Company has agreed to separate the described 447 acres and sell them to the sponsors. In this case technical feasibility is established by having a willing buyer and a willing seller.

FINANCIAL ANALYSIS

Total Project Costs		$1,613,333
Funding Sources	Amount	
1. Legacy	$1,613,333	
Total Funding Contributions		$1,613,333

Purchase price was established by an appraisal conducted for Anaconda Minerals Company. There have been no negotiations on the price and there are no signed agreements on the property. The sponsors believe the appraisal is fair and accurate.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no impacts created in this project. However, the intent of the sponsors is to maintain the area in its natural state to the extent possible while providing public use.

PUBLIC BENEFITS ASSESSMENT

Georgetown Lake is a high-quality fishing source second only to Flathead Lake in use when compared to lakes west of the Continental Divide. The selling of lake frontage to private indivlduals for homesites creates potential hazards for pollution of the lake. This public purchase would attempt to limit that potential. Public need and use demands will in all likelihood become greater and costs increase; this purchase would provide public benefits.

RECOMMENDATION

A grant of up to $580,000 is recommended to be used to negotiate with Anaconda Company for the purchase of that land with the highest reclamation value protecting the greatest shoreline. DNRC must approve the budget for this transaction.

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APPLICANT NAME: Montana State University Research Unit

PROJECT/ACTIVITY: Reclaiming Bentonite Mined Areas in Montana

GRANT AMOUNT REQUESTED: $65,920

TOTAL PROJECT COST: $65,920

PROJECT DESCRIPTION

The Montana State University Research Unit began a study of bentonite mine spoils reclamation in 1979. The study centered around the field testing of various soil amendments to determine successful vegetative practices. This effort was terminated after one field season because the funding was discontinued. The applicant has requested legacy program grant funds to complete the field testing and determine the most effective soil amendment and vegetative techniques. The proposed project would then apply this technology in a large demonstration study at a bentonite mine site in Montana.

Generally, bentonite is mined by surface extraction. Much of the present disturbed land was mined before the enactment of reclamation laws in the 1970s, or is not covered by such laws. Extensive spoil areas remain completely unproductive many years after mining. Costs from not reclaiming these areas include loss of forage production, decreased small and large animal habitat, and loss of livestock grazing land. The purpose of this study is to determine the most effective and economical way to return these areas to a diverse and productive condition.

TECHNICAL FEASIBILITY ASSESSMENT

Establishing vegetation on bentonite spoil material depends on developing a root zone by amending the natural bentonite soil conditions. Specifically, reclamation must focus on three soil conditions: high sodicity, high salinity, and clayey texture. To date, no effective reclamation technology has been developed. Planting shrubs and trees or grasses directly onto spoils

has been unsuccessful. Although amending spoil materials with gypsum, vermiculite, wood chips, straw, or sawdust has enhanced plant germination, successful reestablishment of diverse and productive plant communities has not been achieved.

An extensive study of the rehabilitation of bentonite spoils was begun by the Reclamation Research Unit at Montana State University in 1979. Field plots were established on orphan spoils at Belle Fourche, South Dakota, in the spring of 1980. Treatment plots included combinations of physical (topsoil, wood chips, and manure) and chemical (gypsum, $CaCl_2$, and H_2SO_4) amendments. These plots were seeded with a diverse mixture of grasses, forbs, and shrubs. After the first growing season species evaluations were performed and showed significant differences between treatments. Topsoiled spoils and spoils containing wood chips demonstrated excellent plant establishment. Manure incorporation and chemical amendments resulted in relatively poor plant establishment and growth. Because of its wide scope, this study promised to yield the basic information necessary to direct effective reclamation of these extremely harsh sites. However, funding was discontinued after the first growing season, and long-term treatment effects are not known.

Specific research objectives of the currently proposed study are: 1) to resample vegetation at the Belle Fourche site to determine the most effective soil amendment and seeded or volunteer species; and 2) to use this technology in a large demonstration study at a bentonite mine site in Montana. The techniques and practices resulting from this study would be published in a special publication from the Montana Agricultural Experiment Station. The project could be completed in two years.

FINANCIAL ANALYSIS

Total Project Costs		$65,920
Funding Sources	Amount	
1. Legacy	$65,920	
2. Applicant	-0-	
Total Funding Contributions		$65,920

ENVIRONMENTAL IMPACT ASSESSMENT

The use of soil amendments and improved seed mixes should provide positive long-term environmental impacts to reclaimed areas. Short-term impacts resulting from the reclamation demonstration should be addressed as part of the project.

PUBLIC BENEFITS ASSESSMENT

The proposal would provide and demonstrate improved reclamation techniques to agricultural lands affected by bentonite mining. If successful, the reclamation techniques would reduce soil erosion, improve wildlife habitat, and improve water quality. Primary benefactors would include affected landowners and the bentonite mining industry.

RECOMMENDATION

A grant of up to $65,920 is recommended contingent on DNRC approval of the project scope of work and budget. The grant is further contingent upon DNRC approval of the applicant's documentation that no party can be identified as being reasonably liable or responsible for reclamation of the demonstration site. The applicant would obtain written permission from the land and mineral rights holders, allowing the reclamation activities to proceed and certifying that the site would not be re-mined without provisions for adequate reclamation.

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APPLICANT NAME: Montana Department of Natural Resources and Conservation, Conservation Districts Division

PROJECT/ACTIVITY: Soil Survey and Mapping Project

GRANT AMOUNT REQUESTED: $ 555,000 ('85-'86 biennium)

TOTAL PROJECT COST: $3,455,000 ('85-'86 biennium)

PROJECT DESCRIPTION

The Conservation Districts Division of the Montana Department of Natural Resources and Conservation (DNRC) proposes to provide financial assistance to the Soil Conservation Service (SCS) for work toward completing the Montana state soil survey. The legacy program grant funds would fund nine to ten soil scientists for the 1985-86 biennium.

State soil surveys provide basic information about the soil which is used in making interpretations needed to predict responses of soil to given uses. This information is important in making wise land use planning decisions. With only 49 percent of the state mapped, Montana is far behind other states in completing its soil survey. SCS spends more money on soil mapping in Montana than in any other state. Yet it is estimated that the survey will not be completed and published for 30 more years. Presently, the state of Montana contributes very little funding to this effort.

A completed state-wide survey would be valuable and useful for all Montanans.

TECHNICAL FEASIBILITY ASSESSMENT

The soil scientists funded by this proposal would be employed directly by SCS and follow the directives of that agency in performing soil survey and mapping methodologies.

FINANCIAL ANALYSIS

Total Project Cost	('85-'86 biennium)	$3,455,000

Funding Source	Amount
1. Legacy	$ 555,000
2. USDA Soil Conservation Service	$2,900,000
Total Funding Contributuions	$3,455,000

The funding requested in this application would amount to 16 percent of the cost for the biennium. The funding for nine to ten soil scientists would include salaries, equipment, vehicle, and travel expenses. Currently SCS figures these items amount to about $32,000 per soil scientist per annum.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse long- or short-term environmental effects would result from this project. Final completion and use of the soil survey and mapping information would result in long-term positive environmental effects.

PUBLIC BENEFITS ASSESSMENT

The number and types of public benefits associated with completion of the state soil survey are many. Examples of those benefits include making wise land-use decisions; preparing long-range operational plans for cities, towns, counties, planning boards, ranches, farms, forests, and industrial and residential development; site selection for buildings, highways, reservoirs, recreational areas, etc.; and managing forests, cropland, rangeland, wildlife habitat, and wilderness.

RECOMMENDATION

A grant of $555,000 is recommended for this project contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Whitefish County Water and Sewer District

PROJECT/ACTIVITY: Whitefish River Cleanup

GRANT AMOUNT REQUESTED: $139,314

TOTAL PROJECT COST: $139,314

PROJECT DESCRIPTION

The Whitefish River from the outlet of Whitefish Lake through the City of Whitefish and for several miles downstream has for years been used as a dumping ground for old cars, washing machines, tires, steel drums, and other debris and garbage. As a result, the stream and its riparian zone are

unsightly and offer a contrast from the typical high quality mountain streams in the area. The massive amount of debris has altered the stream channel in some areas and trapped sediments, resulting in an overabundant growth of aquatic weeds. Many area residents, riparian landowners, the City of Whitefish, and groups such as the Whitefish Chamber of Commerce would like to see the river cleaned up so that it would be an asset to the area rather than an eyesore.

The project simply consists of outlining a plan to remove debris from a five-mile stretch of the river (from the Whitefish Lake outlet to the Highway 40 bridge) and then carrying out the plan.

TECHNICAL FEASIBILITY ASSESSMENT

A problem exists because debris, junk, and garbage have been placed in and along the Whitefish River. It is technically feasible to physically remove this material from the area. This would improve the aesthetics and possibly slightly improve the water quality in the river.

This is not an urgent problem. The Whitefish River has been in this condition for many years. The only connection between the present condition of the river and the effects of natural resources development is that sunken logs remain in the river from the early 1900s when logs were floated down the stream to area sawmills. However, a study conducted on the river in 1978 by the Soil Conservation Service (SCS), Fish and Wildlife Service and Montana Department of Fish, Wildlife and Parks (DFWP) recommended that these sunken logs not be removed because they provide good fish habitat (cover) and removal would probably result in bank and stream bottom instability and sedimentation.

The project is quite costly as proposed and would seem to be the type of project best handled with most non-construction activities undertaken with volunteer labor, equipment, etc., donated by local landowners, civic groups, businesses, sportsmen, the City of Whitefish, and others.

FINANCIAL ANALYSIS

Total Project Cost		$139,314
Funding Sources	Amount	
1 Legacy	$139,314	
2 Applicant	$ -0-	
Total Funding Contributions		$139,314

Some project costs, especially administration, seem excessive, as does the time frame. Coordination with the local conservation district or other agency or group could reduce costs considerably. The costs of the proposed project break down as follows: administration--$57,200, professional and technical--$13,000, construction--$49,280 and contingencies--$19,854. No other contributors are identified.

ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impacts of this project would depend on the methods used for removing car bodies and other debris and the other streambank work mentioned. Some short-term increases in turbidity would result from the cleanup activities. It is likely, however, that the project would result in a net positive impact on the environment. Removal of the several sunken logs would most likely not be allowed by the Water Quality Bureau of DFWP because of associated negative impacts.

PUBLIC BENEFITS ASSESSMENT

This project would improve the appearance of the Whitefish River for a five-mile stretch. It would probably improve the floatability of the river and possibly would have a positive effect on water quality.

The people of the City of Whitefish, area businesses, riparian landowners, and possibly some area recreationists would benefit from the project. The public benefits resulting from this project do not appear to be adequate compensation for the expediture of legacy funds.

RECOMMENDATION

A grant of up to $60,000 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana State University Research Unit and Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Acid Generation from Western Mining: Prediction, Amelioration, Control, and Revegetation

GRANT AMOUNT REQUESTED: $515,062

TOTAL PROJECT COST: $515,062

PROJECT DESCRIPTION

This project addresses the generation of acid minesoils and acid mine drainage in western Montana. Hard-rock mines in western Montana are faced with the very expensive problem of reclaiming acid-generating disturbances with very little knowledge of how to restrict this environmental damage or how to correct the damage after it occurs. Most hard-rock mining activities in Montana produce wastes capable of generating acid when exposed to the atmosphere and water.

This project proposes to conduct mine-site research at mines in three separate regions of western Montana to gain working knowledge of the potential for acid mine drainage or minesoil development, neutralization of acid-generating capacity and revegetation of waste sites. Five specific studies, each having its own budget and investigations, comprise this project: (1) determining the source of acid production, (2) determining the amount of acid a material will produce, (3) developing cost-effective methods of

neutralizing acidity, (4) developing techniques and equipment to incorporate neutralizing agents deep into minesoil profiles, and (5) revegetating acid-generating soils. The results of the five separate but related studies would be used to develop a series of handbooks for use by mining interests, regulatory agencies, educators, and other parties involved with generation of acid minesoil and acid mine drainage in western Montana.

TECHNICAL FEASIBILITY ASSESSMENT

This project consists of five specific, related research studies. All five studies and hence the project appear to be technically feasible.

In the study to determine the source of acid production, the investigators plan to develop techniques for predicting the potential for a host rock to produce acid minesoils and acid mine drainage. Several methods would be included that would develop a model for handling acid minesoils or acid mine drainage at a specific site. The study to predict the amount of acid production by improving the weathering method would be used to determine the lime requirement for one-time minesoil neutralization. It would also be used to construct a rapid weathering unit suitable for use by commercial laboratory services in Montana. The study on neutralization techniques would look at the cost effectiveness and technical feasibility of using alternatives to lime for acid neutralization. Such alternatives include coal-fired power plant fly ash, cement plant kiln dust, limestone, phosphates, and municipal sewage sludge. In the fourth study, the objective would be to develop special equipment that will allow cost-effective incorporation of acid neutralizing agents as deep as 40 inches below the surface. Present state-of-the-art equipment allows incorporation of lime to a depth of only about eight inches, which is perceived to be too shallow. The final study would evaluate natural and introduced plant species for revegetation use on amended acid-producing wastes associated with hard-rock mines. Soil depth requirements, species selection, seeding techniques, and nutrient requirements would be determined.

FINANCIAL ANALYSIS

Total Project Cost		$515,062
Funding Source	Amount	
1. Legacy	$515,062	
2. Applicant	-0-	
Total Funding Contributions		$515,062

The project costs include $16,248 for contract administration, $188,918 in professional services (including benefits), $90,000 for drilling, $36,980 for lab analysis, $26,197 for travel and per diem, $40,000 for equipment purchase and $116,719 for other (including indirect) costs. There are no sources of financial support other than the legacy program identified for this project.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project. If the project was successful, positive impacts may result from the improved understanding of acid minesoils and acid mine drainage.

PUBLIC BENEFITS ASSESSMENT

The knowledge gained from this project, as well as the techniques and handbooks developed, may result in reclamation of mined lands, wise use of Montana's natural resources, and more environmentally compatible processing. The project may also provide the knowledge needed to successfully reforest areas damaged by past mining activities.

RECOMMENDATION

The proposed project certainly meets the expressed intent of the legacy program. However, sufficient information can be gained using only one site instead of the three sites proposed. A grant of up to $200,000 is recommended contingent on DNRC approval of the site, project scope of work, and budget.

APPLICANT NAME: Montana State University, Montana Agricultural Experiment Station, Eastern Agricultural Research Center

PROJECT/ACTIVITY: The Influence of Conservation Tillage Practices on Insect Pests of Small Grains

GRANT AMOUNT REQUESTED: $30,000

TOTAL PROJECT COST: $37,000

PROJECT DESCRIPTION

The project would develop data on tillage practices and their influence on insect pests of small grains. These data would be used in recommendations for Montana farmers and ranchers. The insects would include wheat stem sawfly, grasshoppers, and hessian fly.

TECHNICAL FEASIBILITY ASSESSMENT

The increase in conservation tillage (about 10 percent of tillable acres in 1983), coupled with the lack of data on how tilling affects insect pests associated with small grains dictates a need to increase our understanding of this problem. Preliminary data indicate a 63 percent increase in adult sawfly survival under conservation tillage. Soil sampling indicates an increase in survival and oviposition of grasshopper eggs under reduced tillage. These preliminary observations indicate a need to develop scientific experiments to obtain data on tillage and insect interactions.

The sampling study would use sweep-net, D-vacuum, plant, and soil samples. The sampling strategy would take 10 samples from each plot using each method every week from May 1 to September 15. Data would be collected on temporal and spatial distribution damage, and insect population levels. Conducting the study over a three-year period would allow for the determination of tilling influences on population levels.

Conservation tillage will probably increase because of its many advantages (for example, conserving soil moisture, reducing fuel costs). Because this type of tillage is such a radical departure from the conventional practice a

shift of pests will occur. Many insects winter in the stubble. By not incorporating the stubble into the ground, it would be possible to increase the winter survival of some insects not currently considered pests (wheat jointworm, for example). In addition to these two study sites, ten randomly chosen producer fields (five conventional and five conservation) would be sampled once every two weeks using the same procedures stated above.

This project would provide an increased data base on conservation tillage and insect interactions. The data would be incorporated into Montana State University cropping recommendations for producers.

FINANCIAL ANALYSIS

Total Project Cost		$37,000
Funding Sources	Amount	
1. Legacy	$30,000	
2. MSU & Research Center	$ 7,000	
Total Funding Contributions		$37,000

The budget for the study does not show excessive spending and would be adequate to complete the job. Tillage equipment would be purchased to conduct the experiments because most equipment has been removed from the research center in the federal government's attempt to close the station.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no negative impacts from the study. Benefits through insect control would occur from the study results.

PUBLIC BENEFITS ASSESSMENT

Noticeable benefits to the general public would be slow. The study would result in recommendations to farmers who in turn would implement practices to control pests and increase crop production. As crop production increases, the economy of the community would be expected to rise. There are many communities in the dryland farming areas of Montana.

RECOMMENDATION

A grant of up to $30,000 is recommended for this project subject to the following conditions:

1. that itemized lists of equipment be purchased and disposition of that equipment upon project completion be approved by DNRC, and

2. that a more detailed program be set out before funding to establish that a useful product can be obtained in the proposed time frame.

3. DNRC approves the project scope of work and budget.

APPLICANT NAME: Roosevelt County Conservation District

PROJECT/ACTIVITY: Saline Seep Treatment

GRANT AMOUNT REQUESTED: $5,000

TOTAL PROJECT COST: $6,500

PROJECT DESCRIPTION

During the last two years, six counties in northeast Montana have cooperated with the Triangle Conservation District (TCD) in a saline seep abatement program. The approach was to treat two seep areas in each county to demonstrate the successful methods developed in the Triangle area (see project summary for Triangle Conservation District in this report). Roosevelt County would like to continue this effort and treat three additional seeps as demonstration sites in different geographical areas of the county during the next biennium.

Saline seep has claimed about 300,000 acres of formerly productive farmland in Montana. Although seep is most severe in the Triangle area, it is also a state-wide problem. This approach is well supported by the farmers that Triangle has worked with; their reclamation plan implementation rate is very high.

TECHNICAL FEASIBILITY ASSESSMENT

The technical team from the TCD would develop these three demonstration sites. They would do the drilling, develop the reclamation plans and follow up with landowners in cooperation with the local Soil Conservation Service and Conservation District. The local groups would conduct tours and disseminate information on the technique in an attempt to develop its widespread implementation.

FINANCIAL ANALYSIS

Total Project Cost		$6,500
Funding Sources	Amount	
1. Legacy	$5,000	
2. Federal (ASCS) Cost Share	$1,000	
3. Farmer Contribution	$ 500	
Total Funding Contributions		$6,500

This budget is adequate based on costs for previous saline seep treatments.

ENVIRONMENTAL IMPACT ASSESSMENT

Seep lands are totally unproductive and a source of contamination to ground and surface water. This treatment would return these lands to production and reverse the present degradation of water quality.

PUBLIC BENEFITS ASSESSMENT

This project would provide water and soil conservation benefits by reversing the salinization process, returning the soils to production, preventing the concentration of water in salinized areas, therefore preventing the present surface and ground water contamination.

RECOMMENDATION

Up to $5,000 is recommended for this project contingent on DNRC approval of a scope of work and budget. If the Triangle Saline Seep project is fully funded, it would include this work. In that event, this offer would be withdrawn.

APPLICANT NAME: Yellowstone County

PROJECT/ACTIVITY: Urban/Rural Water Alert, Data Centralization and Utilization

GRANT AMOUNT REQUESTED: $100,000

TOTAL PROJECT COST: $100,000

PROJECT DESCRIPTION

Yellowstone County is Montana's largest and fastest growing county. Growth in the past several years has placed tremendous pressure on the water resources in the area. Some of this growth (development) has occurred in areas having insufficient quantity or quality of water resources for domestic use; water-related problems have resulted. A major problem identified by the applicant is a lack of data or access to data on area ground water resources. This lack of data has led to uninformed decisions made by regulatory agencies, planning boards, and others. The applicant feels that if all existing ground water quantity and quality data were gathered into a central area water data bank, decision-makers would be able to use the ground water data and have the information needed to make necessary short- and long-range growth and other decisions where ground water availability, quantity, and quality are relevant issues.

The proposed project has five phases. Phase 1 involves seeking out and evaluating existing ground water data in the area and entering the reliable data into computer and hard-copy files. The format would allow data to be entered into the Montana Bureau of Mines and Geology's (MBMG) Ground Water Information Center (GWIC) files. Phase 2 involves preparing maps and texts that show and explain area ground water data. The maps would emphasize such

items as limited ground water availability, ground water depths, expected yields, and water quality problems. Phases 3, 4 and 5 relate to solving area water problems. Items such as alternative solutions, costs, responsibilities, and time frames would be addressed.

TECHNICAL FEASIBILITY ASSESSMENT

The project appears technically feasible. However, the services of state and federal agencies, such as MBMG and U.S. Geological Survey (USGS), could be used to reduce administrative costs, eliminate duplication of effort, and share in some of the costs. Both agencies have indicated a willingness to become involved in the project from the standpoints of providing professional services, administration, and cost-sharing. Including these two agencies in the project would improve project effectiveness and efficiency. The estimated project cost appears somewhat low to accomplish all project phases. The amount budgeted may be enough to accomplish only Phases 1 and 2, although inclusion of MBMG and USGS with the resulting cost-sharing may allow for accomplishing more than just Phases 1 and 2.

FINANCIAL ANALYSIS

Total Project Costs		$100,000
Funding Sources	Amount	
1. Legacy	$100,000	
2. Applicant	-0-	
Total Funding Contributions		$100,000

The project budget shows $6,000 in administrative costs, $83,500 in professional/technical costs, and $11,500 in contingencies. No other contributions to the project are identified.

MBMG and USGS cost-share funds may be available for this project. The proposed project probably could not be completed as proposed for the estimated costs, especially without the cost-sharing.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated from this project.

PUBLIC BENEFITS ASSESSMENT

The project would provide technical assistance to promote the wise use of Montana's natural resources. The people of Yellowstone County, state and local agencies, and other area decision-makers would benefit from this project. The improved knowledge of the area's ground water resources would compensate for the costs.

RECOMMENDATION

A grant of up to $100,000 is recommended contingent upon (1) the applicant including either MBMG or USGS, or both, in the project and making maximum use of available cost-sharing from the agencies, (2) DNRC approval of a final detailed scope of work and budget, (3) the project being coordinated with the GWIC, and (4) the project being coordinated with the Yellowstone County Critical Lands Inventory. The requested level of funding is sufficient for completion of only Phases 1 and 2 of the proposed project.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Giant Springs State Park Improvements

GRANT AMOUNT REQUESTED: $150,000

TOTAL PROJECT COST: $200,000

PROJECT DESCRIPTION

Giant Springs is located on the Missouri River north of Great Falls. It is the most popular site in the state park system, receiving about 172,000 visitors per year.

The property is dissected by a coulee that was filled with old car bodies and other trash. The coulee is eroding, creating unsafe and unsightly conditions. Use of the site has increased to the point where additional sanitary facilities are needed.

This project would include landscaping and cleanup of the coulee area, construction of a new comfort station and insulation of an existing comfort station.

TECHNICAL FEASIBILITY ASSESSMENT

This project would upgrade both the site and the facilities at Giant Springs State Park. Plans call for the coulee erosion to be halted by grading and reshaping the banks. Once this is accomplished, landscaping of the area would be necessary. A new comfort station and associated utilities would be installed to provide for increased demand. The existing comfort station near the fish hatchery is highly energy consumptive. Insulation would be added to increase efficiency and decrease operation costs.

The project would be completed within the upcoming biennium.

FINANCIAL ANALYSIS

Total Project Cost		$200,000
Funding Sources	Amount	
1. Legacy	$150,000	
2. Federal & Private Revenue Account	50,000	
Total Funding Contributions		$200,000

The $50,000 contribution from the Federal and Private Revenue Account would require legislative approval. Roughly 25 percent of the project budget would be for professional/technical costs and 75 percent would be for construction costs.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would reduce impacts now affecting the site, including soil erosion in the coulee and potential impacts from overuse of the existing comfort station.

No adverse environmental impacts are expected as a result of this project.

PUBLIC BENEFITS ASSESSMENT

Primary benefactors of this project would be the 172,000 annual visitors to the Giant Springs State Park. Montanans in general would benefit from the continued upgrading and maintenance of the state park system.

This project would help to protect a renewable resource in Montana, state recreational lands, and facilities.

RECOMMENDATION

A grant of up to $150,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC,

2. that proof of other funding is committed to complete the project, and

3. that bids are approved by DFWP and DNRC.

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APPLICANT NAME: Glen Lake Irrigation District

PROJECT/ACTIVITY: Therriault Creek Syphon Construction

GRANT AMOUNT REQUESTED: $155,000

TOTAL PROJECT COST: $155,000

PROJECT DESCRIPTION

The Glen Lake Irrigation District of Eureka, Montana provides irrigation water to 3,156 acres. The District has a persistent bank sloughing problem in an unstable section of its main canal. The critical section is about one mile long and is on a relatively steep hillside along Therriault Creek. The bank sloughing action results in restricted ditch flows and increased maintenance costs. The District is concerned that a canal failure might occur, which would result in erosion damage to the creek below and damage to a state highway.

The District has proposed installation of a 46-inch syphon to eliminate the problem ditch section. The project would eliminate over two miles of canal and reduce associated maintenance costs.

TECHNICAL FEASIBILITY ASSESSMENT

The major problem identified is bank sloughing in a one-mile section of canal. The Soil Conservation Service (SCS) has indicated that the cause is saturated soils on very steep slopes. SCS indicates that minor maintenance work is ongoing and that potential risk of canal failure is high. Failure would result in loss of irrigation water supply for the entire Glen Lake District until the ditch could be repaired. Failure may also result in extensive property damage along Therriault Creek.

SCS conducted a preliminary on-site investigation and considered three alternatives as follows: 1) operate the canal in its present condition with close monitoring, 2) line the canal and install a toe drain, or 3) replace about two miles of canal with about 2,000 feet of syphon. They recommended alternative 3 because it would eliminate the existing risk of failure and has a longer life than alternative 2 at a comparable cost.

The proposed solution is technically feasible and would eliminate the problem. The construction project could be completed within the funding biennium.

FINANCIAL ANALYSIS

Total Project Costs		$155,000
Funding Sources	Amount	
1. Legacy	$155,000	
2. Applicant	-0-	
Total Funding Contributions		$155,000

The total project cost is estimated to be $155,000, which includes $138,000 construction and $16,200 contingency. SCS would provide assistance to the District for design and construction management activities at no cost to the owner.

The applicant has also requested a $155,000 grant from the Water Development and Renewable Resource Development programs as an alternative to a legacy program grant. DNRC's ranking recommendation for that request would result in availability of a $155,000 water development loan at the bond interest rate for the project. The applicant currently charges an annual fee of $20 per acre for water delivered for all lands in the project area.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would require crossing Therriault Creek with a large-diameter syphon pipe. Clearing timber and constructing an access road would also be required in the drainage. Final short- and long-term impacts should be addressed during the design and permit acquisition phase of the project.

PUBLIC BENEFITS ASSESSMENT

The proposed project would benefit members of the Glen Lake Irrigation District. Primary benefits include: improved agricultural water supply; improved water quality; water conservation; and prevention of property damage.

RECOMMENDATION

A grant of up to $155,000 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Rosebud Development

GRANT AMOUNT REQUESTED: $105,000

TOTAL PROJECT COST: $105,000

PROJECT DESCRIPTION

Rosebud State Recreation Site is located along the Yellowstone River at Forsyth. It consists of two units: one located next to the U.S. Highway 12 bridge and the other, larger site located one mile downstream.

The existing developments were constructed in the early 1970s. Since that time, use has increased to 100,000 visitors per year, creating a need for more facilities and improved maintenance at the site. Increased use is partially accounted for by population impacts from mining and construction at Colstrip.

The riverbank within this popular recreation area is eroding. Access to the river for canoes is difficult, the roads are in poor shape, a foot trail connecting the two areas is needed, and the water system needs to be expanded.

This project will address all the problems listed above.

TECHNICAL FEASIBILITY ASSESSMENT

This project would:

1. Riprap a 450-foot section of the riverbank that is eroding,
2. Construct a canoe access trail to a point above the diversion dam,
3. Construct a 100-foot-long boat ramp,
4. Connect the two properties with a one-mile foot trail,
5. Grade and regravel park roads where needed, and
6. Extend the water system and add water hydrants to the new line.

This project would be constructed in one phase. Construction should begin in the fall of 1985 and be completed the next spring.

FINANCIAL ANALYSIS

Total Project Cost		$105,000
Funding Sources	Amount	
1. Legacy	$105,000	
Total Funding Contributions		$105,000

Approximately 20 percent of the proposed budget is for professional and technical services. The rest of the budget will cover construction costs (labor, equipment, and materials).

ENVIRONMENTAL IMPACT ASSESSMENT

Some short-term impacts of the project may include fugitive dust associated with construction and road work, noise, and equipment traffic. Long-term positive impacts may include reduced erosion on the riverbank, and reduced maintenance on-site.

PUBLIC BENEFITS ASSESSMENT

This project would benefit the public that uses the recreation area. The general public would benefit through conservation and maintenance of a recreational area.

RECOMMENDATION

A grant of up to $105,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC, and

2. that bids are approved by DFWP and DNRC.

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APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Butte Mine Flooding Monitoring

GRANT AMOUNT REQUESTED: $133,195

TOTAL PROJECT COST: $162,761

PROJECT DESCRIPTION

Pumping the underground mine workings on the Butte Hill ceased on April 23, 1982. Since that time, water has been allowed to flood the underground mines and the Berkeley Pit at rates of 3,000 to 10,000 gallons per minute. The Montana Bureau of Mines and Geology (MBMG) proposes to monitor and evaluate the potential environmental impact of the mine flooding on ground water in Butte and the effects to Silver Bow Creek. This proposal would purchase monitoring equipment to measure the water quality of the entire water column profile in the Berkeley Pit and other shafts. This data would represent the actual quality of the water more than the previous shallow monitoring. This proposal would also fund continued seismic monitoring in the area and computer modeling of the flooding.

TECHNICAL FEASIBILITY ASSESSMENT

The Anaconda Minerals Company, the Montana Department of State Lands (DSL), MBMG, and the U.S. Geological Survey (USGS) have worked together on a ground water monitoring program in the area since 1982. The 1983 Legislature appropriated $60,000 to MBMG for monitoring wells and surface sampling. This legacy proposal would expand the cooperative level of monitoring. Information generated from the monitoring program would allow predictions about the severity of potential toxic heavy-metal contamination to ground water and surface water. A final report detailing the monitoring program and its findings will be prepared, published, and distributed. The information would be useful to local government officials, DSL, DFWP, Department of Health and Environmental Sciences (DHES), Anaconda Minerals Company, USGS, Environmental Protection Agency (EPA), and citizens of the Upper Clark Fork Drainage.

Special depth-profiling equipment would need to be purchased to evaluate the water quality parameters of the water in the mine shafts. This equipment would be useful to other state agencies involved with ground water data collection and analysis.

The selected alternatives appear to be the most feasible and would provide useful information within two years. MBMG and USGS plan to continue funding low-level monitoring of the mine flooding situation beyond the end of the study.

FINANCIAL ANALYSIS

Total Project Cost		$162,761
Funding Sources	Amount	
1. Legacy	$133,195	
2. MBMG	29,566	
Total Funding Contribution		$162,761

Of the $133,195 grant, $66,436 would provide salaries and benefits to four hydrogeologists, a geophysicist, an environmental engineer, technicians, and student assistants. The remaining $66,757 would be for chemical analyses, travel, equipment, supplies, publication, computer, and indirect costs to MBMG. Cost estimates appear reasonable and adequate.

MBMG has requested $99,527 from the Water Development Program for the hydrological portion of this project.

Some reviewers feel the Anaconda Minerals Company should pay for this monitoring, but DSL personnel indicate that they cannot require this monitoring based on existing data that indicate the problem does not warrant the expanded monitoring.

ENVIRONMENTAL IMPACT ASSESSMENT

No long- or short-term adverse environmental impacts would result from the project. The results would provide an assessment of the toxicity of heavy metals in ground water associated with the Butte mine flooding. Results from the study and the modeling may help identify strategies to prevent or lessen

impacts from the existing contamination problem, thereby providing positive environmental impacts. The seismic portion of the project could help predict seismic activity allowing preventive safety measures to be taken.

PUBLIC BENEFITS ASSESSMENT

This proposal would help protect surface and ground water resources from contamination as well as provide research to assess the potential environmental damage from resource development in Butte. Citizens of Butte and landowners along Silver Bow Creek would be the primary benefactors. Ultimately, all Montanans would benefit if this project prevents ground water and surface water contamination of the Clark Fork River and its basin.

RECOMMENDATION

A grant of up to $133,195 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana State University, Water Resources Research Center

PROJECT/ACTIVITY: Role of Clinker in the Hydrogeologic Regime of the Southeastern Montana Coal Region

GRANT AMOUNT REQUESTED: $44,400

TOTAL PROJECT COST: $54,406

PROJECT DESCRIPTION

The Water Center at MSU is involved in research relative to state and regional needs. The Water Center does not maintain a permanent research staff. Annual research programs are selected from proposals submitted by faculty members within the university system, and the research is conducted by those members. Priority research areas are identified and proposals are screened by an Advisory Council composed of the heads of the state water agencies, state and federal water agency personnel, and representatives from industry, consulting firms, environmental groups, and the general public. The Water Center provides the administrative framework for the program. It receives and disburses the funds, monitors the progress on the projects, and receives, prints, and disseminates the final reports. The principal source of Water Center funding has been federal appropriations of approximately $115,000 per year. The 48th legislature appropriated $30,000 of state funds for the 1984-85 biennium, and some matching dollars and in-kind services have been available through other state resources. In March of 1984, Congress passed the Water Resources Research Act of 1984, which extends federal participation in the program through fiscal year (FY) 1989. This legislation authorizes funding of up to about $160,000 per year to the Water Center and requires a nonfederal match of one-to-one in the first two years, increasing to two-to-one nonfederal matching during the last two years.

MSU proposes to expand the research program of the Water Resources Research Center and to provide part of the state match required by the federal program through the use of legacy program funds. Because it is designed to blend with the federal program, the proposed project has been screened by members of the Advisory Council. This proposal would be integrated into FY 1985 and FY 1986 research programs along with the federally funded projects.

All the large coal strip mining operations in the state produce coal from the Tongue River Member of the Paleocene Fort Union Formation which crops out in southeastern Montana. The Tongue River Member is composed of coal beds, shale, channel sandstones, and extensive deposits of clinker. The clinker is formed when coal beds exposed at the surface ignite and burn back into the hillside. The high temperatures bake and alter the overlying rock, which often eventually collapses into the void created by the burned-out coal bed. Clinker deposits are typically highly fractured and red in color. Since clinker is formed because of its association with coal, it is also part of the coal hydrogeologic systems, and thus mine impact assessment and reclamation plans must consider the role of clinker in the local and regional hydrogeologic system.

In southeastern Montana, over 1,000 square miles of the land surface--19 percent of the exposed Tongue River Member--is clinker. Although extensive hydrogeologic work has been conducted by state and federal agencies and private industry, the hydrogeologic properties of clinker and its role in ground water recharge-discharge have not been addressed in detail.

The Water Resources Center proposes to determine the role of clinker in the hydrogeological areas of the southeastern Montana coal region. The proposed research would compile existing documentation and provide field investigation and data analysis which would be of major importance to the regulatory agencies as they assess compliance of existing mines, review new permit applications, and plan and require hydrogeologic monitoring.

TECHNICAL FEASIBILITY ASSESSMENT

Project objectives include:

1) examination of existing literature on the hydrogeology of clinker as well as the thousands of pages of unpublished data submitted to the Department of State Lands (DSL) in compliance with mining permit applications and compliance requirements. Data available from the Bureau of Land Management (BLM) and the U.S. Geological Survey (USGS) as well as the published literature would also be compiled.
2) a detailed review of existing hydrogeochemical data for clinker deposits and related Fort Union flow systems to determine if water quality data could be used to quantify recharge rates to the clinker.
3) water quality sampling of selected existing wells completed in clinker and springs to further examine water quality versus recharge relationships.

Once the data base has been collected, the role of clinker in transmitting ground water and providing an avenue for recharge to the local and regional ground water systems would be assessed. By using existing hydrogeologic data, three study sites in southeastern Montana would be selected for study. Each site would have existing wells finished in clinker, and clinker would be present at one or all of the following positions in the ground water flow systems: 1) in the recharge area at the head of the flow system, 2) in the middle of the system between the recharge and discharge area, and 3) in the discharge area. Basic water chemistry and some water level fluctuation data

would be available for the selected wells. Selected wells would be sampled for key ions as well as tritium carbon 14 and stable isotopes. Wells in the coal aquifer system upgrade from the clinker wells would also be sampled. An attempt would be made to identify recharge water by a mixing curve.

All hydrogeologic data would be assessed and the hydrogeologic role of clinker in the coal region would be qualitatively and quantitatively modeled.

Predicting and mitigating hydrologic impacts from coal mining is an important part of the regulatory process, mandated by law in Montana's Strip and Underground Mine Reclamation Act. Deposits of clinker are commonly associated with coal seams and play an important role in the hydrologic regime. Unfortunately, this role is frequently not well understood. This is a timely project, in that it would use previously gathered data, and would not require the extensive collection of new data.

With a better understanding of the hydrologic role of clinker in the coal region, mining companies and regulatory agencies would be better equipped to design and review mining operations with an eye toward minimizing impacts to the hydrologic system. This would be useful for both existing mines desiring to expand active mines as well as those still in the planning stage. Local inhabitants of mining areas would benefit from reduced adverse effects on the hydrologic system.

The project would probably generate a need for additional studies, but it is an important first step toward understanding the hydrologic role of clinker in the coal region.

This project ranked tenth of 16 proposals reviewed by the Montana Water Resources Research Center. It could be completed in two years. MSU would administer the project.

FINANCIAL ANALYSIS

Total Project Costs		$54,406
Funding Sources	Amount	
1. Legacy	$44,350	
2. MBMG	10,056	
Total Funding Contributions		$54,406

Salaries and benefits for researchers and assistants would total $38,830. Water quality analysis would cost $3,000. Cost for travel, supplies and publications would be $3,500, and indirect costs to MSU and the MBMB would run $9,076.

Cost estimates appear reasonable and adequate. Other funding sources could include the Montana Department of State Lands.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated from this project. The project would lead to a better understanding of coal mine hydrology, and would help reduce adverse impacts by promoting better planning of mining and reclamation.

PUBLIC BENEFITS ASSESSMENT

This project would provide research to assess past and potential environmental damage from natural resource development and would promote efforts to make processing more environmentally compatible.

Benefactors would be residents of the mine areas and adjacent landowners, regulatory agencies, and all Montanans if the project results in reduced adverse environmental impacts.

RECOMMENDATION

A grant of up to $44,400 is recommended contingent on approval of the project scope of work and budget, and on MBMG providing written documentation of its funding commitment.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Fort Maginnis State Monument

GRANT AMOUNT REQUESTED: $35,000

TOTAL PROJECT COST: $35,000

PROJECT DESCRIPTION

Fort Maginnis was a military post along the Carroll Trail in the 1880s. The fort is northeast of Lewistown near the old ghost town of Malden and was designated a state monument in 1968.

This project would protect Fort Maginnis and explain its history to the public. Specific work would improve the access road to the site and build a new road and parking area, create minimal sanitary facilities, install interpretive signs, and fence a portion of the area to exclude livestock.

TECHNICAL FEASIBILITY ASSESSMENT

The project could be completed in the 1986-87 biennium. More information will be needed to complete a technical feasibility assessment on this project.

FINANCIAL ANALYSIS

Total Project Cost		$35,000
Funding Sources	Amount	
1. Legacy	$35,000	
Total Funding Contributions		$35,000

The proposed budget includes $7,000 for professional and technical costs, $7,000 in labor costs, and the remainder of the budget for construction materials and equipment.

ENVIRONMENTAL IMPACT ASSESSMENT

An environmental impact assessment would be done when final project design and methodology are complete.

PUBLIC BENEFITS ASSESSMENT

Future users of the Fort Maginnis State Monument would benefit from this project. Work towards the preservation of this cultural era, physical preservation, and public use of this site would enhance renewable resources in Montana recreation areas.

RECOMMENDATION

A grant of up to $35,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC, and

2. that bids are approved by DFWP and DNRC.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Yellow Bay Fence

GRANT AMOUNT REQUESTED: $10,000

TOTAL PROJECT COST: $10,000

PROJECT DESCRIPTION

Yellow Bay is on the east shore of Flathead Lake. The Yellow Bay Biological Station of the University of Montana is contiguous with the Yellow Bay Recreational Area, which is administered by the Department of Fish, Wildlife and Parks (DFWP). The biological station has frequently had scientific experiments disturbed and suffered vandalism because of trespassers from the recreation area. Control of the area against trespassers becomes extremely difficult during cherry harvest season because migrant laborers invade the camp site. This project would construct a chain-link fence along the boundary line.

TECHNICAL FEASIBILITY ASSESSMENT

This project would be complete in late summer, 1985. The final result would be a chain-link fence along the boundary between the Yellow Bay Recreation Area and the Biological Station.

No previous work has been done on this project.

More information on the proposed project would be needed for a complete technical feasibility assessment.

FINANCIAL ANALYSIS

Total Project Cost		$10,000
Funding Sources	Amount	
1. Legacy	$10,000	
Total Funding Contributions		$10,000

The proposed budget is split almost evenly between labor and construction costs (material and equipment). No contribution is expected from the University of Montana Biological Station, because the University of Montana owns the property and by agreement allows DFWP to operate the recreational site.

ENVIRONMENTAL IMPACT ASSESSMENT

Although no adverse environmental impacts are expected from this project, more information will be needed to complete an environmental impact assessment.

PUBLIC BENEFITS ASSESSMENT

Staff and students at the University of Montana Biological Station would benefit from this project because of reduced trespassing and disturbances caused by Recreation Area visitors.

RECOMMENDATION

A maximum grant of up to $10,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC, and

2. that bids are approved by DFWP and DNRC.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Hell Creek Recreation Area

GRANT AMOUNT REQUESTED: $75,000

TOTAL PROJECT COST: $75,000

PROJECT DESCRIPTION

Hell Creek Recreation Area is a recreation site serving 58,000 visitors annually. The area is about 26 miles north of Jordan on Fort Peck Reservoir.

The camping area is inadequate to serve the users of the site; other improvements and maintenance work need to be done.

This project would relocate the main road, construct a camp loop road, provide camping facilities, improve the beach area, and landscape the caretaker's residence area.

TECHNICAL FEASIBILITY ASSESSMENT

Relocation of the main access road would provide more usable land for recreational activities. With the improved and expanded facilities, visits are expected to increase.

No previous work has been done on this project. The work described in the proposal could be completed in two years.

FINANCIAL ANALYSIS

Total Project Cost		$75,000
Funding Sources	Amount	
1. Legacy	$75,000	
Total Funding Contributions		$75,000

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated as a result of this project. However, more detailed project plans need to be completed before a final environmental impact assessment can be completed.

PUBLIC BENEFITS ASSESSMENT

This project would help to protect renewable resources through conservation of the state's recreational lands. The citizens of Montana, as well as the park users, would benefit from this project.

RECOMMENDATION

A grant of up to $75,000 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC, and

2. that bids are approved by DFWP and DNRC.

APPLICANT NAME: Montana State University, Plant and Soil Science Department

PROJECT/ACTIVITY: Beaver Creek Fire Erosion Study

GRANT AMOUNT REQUESTED: $34,656

TOTAL PROJECT COST: $34,656

PROJECT DESCRIPTION

This project proposal would document and extrapolate causes and effects of a major forest-fire-related soil erosion event including the documentation of slope stabilization, revegetation, and continued erosion on this site.

TECHNICAL FEASIBILITY ASSESSMENT

A rainstorm during the Beaver Creek fire of August 27-31, 1984, triggered massive slope erosion, debris flows, and flooding in the Gates of the Mountains Wilderness and Wilderness Study Area north of Helena. The Beaver Creek fishery associated with Holter Lake was severely damaged and about 800 acres of steep forested land in this watershed have lost up to six inches of topsoil. The U.S. Forest Service is carrying out an emergency slope and stream channel stabilization project with federal funds.

This erosion occurred after a severe fire combined with a two-year frequency rainstorm event. Such events may occur elsewhere in Montana after natural fire or prescribed burning on similar landforms and soils. This massive erosion presents a unique opportunity to measure impacts of fire and resultant erosion in a Montana environment, and then to monitor recovery. This proposal would be for a 24-month project to monitor and document the success of slope stabilization through reseeding and slope bar installation. It would also determine the combinations of landform, soil, and vegetation susceptible to this type of erosion after fire, and measure the amount of erosion and deposition that occurred.

FINANCIAL ANALYSIS

Total Project Cost		$34,656
Funding Sources	Amount	
1. Legacy	$34,656	
Total Funding Contributions		$34,656

The budget appears adequate to complete the project. The work is being coordinated with the Forest Service; their contributions or assistance are not noted in this application.

ENVIRONMENTAL IMPACT ASSESSMENT

Fires and rainstorms are natural phenomena. However, extreme environmental damages have occurred, some of which this project will study. The project should provide measures for minimizing the long-term effects of those impacts.

PUBLIC BENEFITS ASSESSMENT

The damage has already occurred and was caused by natural uncontrollable acts. Measures to limit the long-term environmental and resource damage through erosion control, reforestation, grass reseeding, and watershed stabilization would benefit the local community and could also provide future assistance to other communities.

RECOMMENDATION

A grant of up to $34,656 is recommended for this project contingent upon DNRC approval of the project scope of work and budget, and on coordination with the U.S. Forest Service, Helena National Forest District.

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APPLICANT NAME: University of Montana, Botany Department

PROJECT/ACTIVITY: Clark Fork Basin Denuded Zone Sediment: Effects on Germination and Net Productivity of Two Riparian Grasses

GRANT AMOUNT REQUESTED: $21,797

TOTAL PROJECT COST: $21,797

PROJECT DESCRIPTION

For the past century the process waters released from mining and smelting operations on the Clark Fork's headwaters have transported considerable quantities of metal-laden sediment downstream. During high-flow periods (particularly spring thaw) lateral deposition of these sediments on the flood plain has led to heavy metal accumulations known to be hazardous to livestock. A system of settling ponds completed in 1954 at Warm Springs was intended to trap and precipitate out metals. However, before the settling ponds were established (and in subsequent isolated events) great quantities of metal wastes have been distributed on the upper Clark Fork flood plain wherever topography favors deposition.

As far downstream as Drummond, documentation shows isolated areas of riparian sediment with elevated metal concentrations. These areas are denuded of vegetative cover. A study of the flood-irrigated Grant-Kohrs Ranch National Historic Site in Deer Lodge showed that heavy metal contamination in the riparian zone was attributed primarily to lateral deposition of contaminated sediment. The Soil Conservation Service (SCS, 1983) described episodes of bank wasting along stretches of the meandering Clark Fork River at Deer Lodge. Analyses of riverside soil profiles confirm recent suggestions concerning the stream channel reintroduction of metal contaminants from

diffuse sources. Although preliminary data indicate dramatic changes in plant community composition over short distances, questions remain regarding the causes of these alterations.

The University of Montana proposes a laboratory-greenhouse study to determine if the alterations are chemical or physical, and at what elevated level of heavy metals in the soil a particular plant species can survive or will suffer no loss in productivity.

The applicant would assess Redtop bentgrass and Tufted hairgrass performance in terms of net primary productivity (NPP), or biomass accumulation over time. Redtop bentgrass is a dominant understory component of the Clark Fork flood plain. Additionally, germination trials would be conducted to test survival rates of early developmental stages in contaminated growth media. Atomic absorption spectrophotometry would be used to determine the heavy metal content of various growth media and consequent uptake in root and shoot portions of the test species.

TECHNICAL FEASIBILITY ASSESSMENT

The project would consist of two phases: first, a controlled environment germination trial would test early developmental stage survival rates; and second, an assay of the target species would be conducted to determine the effect of contaminated sediments on germination and plant productivity.

The study would measure net primary productivity of Redtop bentgrass and Tufted hairgrass in 10 different growth media preparations: a contaminated substrate taken from the surface sediment of a denuded zone at the Grant-Kohrs Ranch; a dilution series of eight other media preparations composed of decreasing proportions of contaminated substrate, and increasing proportions of an uncontaminated riparian sediment; and a control preparation consisting only of the uncontaminated sediment.

Certified seed would be used for this study.

Quality assurance procedures, including the introduction into the sample stream of replications, standard additions, and federal standards, would follow guidelines set by the Gordon Environmental Laboratory.

The investigators of this study would produce a final report describing the method, results, and conclusions of the germination trials and bioassay. This information would help provide a basis for the difficult and complex decision-making processes for future attempts at restoring and maintaining the Clark Fork ecosystem.

Reviewers suggest that a thorough literature review be conducted, and results of similar research be incorporated into the proposal. Some techniques proposed by the applicant are not technically sound alternatives, according to reviewers, and should be revised. Reviewers also question the soils background and experience of the researchers in the area of metal toxicity. The proposal should be coordinated with other Clark Fork River studies.

FINANCIAL ANALYSIS

Total Project Cost		$21,797
Funding Sources	Amount	
1. Legacy	$21,797	
2. U of M	-0-	
Total Funding Contributions		$21,797

Salaries and benefit costs would total $17,159 for three professional investigators, and laboratory and clerical assistance. Travel, supplies, and equipment maintenance would cost $1,005, and indirect costs to the University would be $3,633.

Cost estimates appear adequate and reasonable. No other funding sources have been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts would result from this project. Results may prompt action that would reclaim contaminated areas, resulting in positive impacts.

PUBLIC BENEFITS ASSESSMENT

The proposal would provide research to assess past environmental damage from natural resource development. Benefactors would include agency personnel conducting reclamation techniques in the Clark Fork River drainage. Montana citizens may benefit if study results prompt action that reduces contamination concentrations in the Clark Fork River basin.

RECOMMENDATION

A grant of up to $21,797 is recommended contingent on DNRC approval of the project scope of work and budget, and on approval by the Clark Fork Interagency Task Force.

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APPLICANT NAME: Lewis and Clark County Conservation District

PROJECT/ACTIVITY: Lewis and Clark County Conservation Tillage Program

GRANT AMOUNT REQUESTED: $27,139

TOTAL PROJECT COST: $31,639

PROJECT DESCRIPTION

Lewis and Clark County contains approximately 100,000 acres of cropland, with 25 percent of that having moderate to severe wind and/or water erosion. The erosion problem adversely affects some 250 to 300 agricultural units.

With increasing operational costs, changes in tillage methods, and the need to correct a major resource problem (loss of soil through erosion) the Conservation District proposes to demonstrate tillage practices, purchase a conservation tillage (no till) drill, and educate the local farmers through meetings and tours within the county.

TECHNICAL FEASIBILITY ASSESSMENT

The proposal would give agricultural operators the opportunity to be educated about all aspects of conservation tillage and then be provided with technical assistance and equipment to apply the concepts. The basic thrust of the program would be the ongoing educational aspects coupled with one-on-one follow-up to ascertain problems and successes of conservation tillage.

Appropriate equipment, guides, and technical assistance would serve as tools to fully carry out the educational process.

In more detail, the basic proposal is described in the following parts:

1. The latest information and techniques of no-till, minimum tillage, flex tillage, chemical use, pesticides, fertilizers, and other components of conservation tillage would be assembled for interested cooperators.

2. A conservation tillage drill would be purchased and maintained by the Conservation District and would be made available to interested cooperators. A Conservation District technician would accompany the drill to present tillage concepts and proper application of drilling techniques.

3. Cooperators would be required to attend a one-day training session sponsored by the Conservation District to introduce the conservation tillage concept and be required to develop a three-year Conservation Tillage Program to meet specific needs and special situations.

4. The Conservation District would provide individual follow-up assistance to the cooperator during the growing season to identify problems and to help modify and refine the Conservation Tillage Program on a year-to-year basis.

FINANCIAL ANALYSIS

Total Project Cost		$31,639
Funding Source	Amount	
1. Legacy	$27,139	
2. Applicant	4,500	
Total Funding Contributions		$31,639

The budgeted items included do not appear to be excessive and reviewers have indicated the request is adequate to acquire expected results. The major expenditure is for the purchase of a no-till drill which would become the property of the Conservation District.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would serve as an educational guide to protect our environment from soil loss through wind and water erosion.

PUBLIC BENEFITS ASSESSMENT

This project may directly benefit some 250 to 300 farm units through education of tillage practices that would control the loss of top soil. Secondary benefits would be gained for the local community through saving the soil resource for future generations.

RECOMMENDATION

A grant of up to $27,139 is recommended for this project.

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APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Clark's Lookout State Monument Development

GRANT AMOUNT REQUESTED: $142,760

TOTAL PROJECT COST: $403,399

PROJECT DESCRIPTION

Clark's Lookout, located just north of the town of Dillon, Montana, is a significant landmark of the Lewis and Clark Expedition. As a state monument, this historic resource will be preserved and interpreted for the enjoyment of Beaverhead Valley residents and visitors.

The site will be managed to provide a historical and geological interpretive area, and a recreational and cultural experience for visitors. A ten-foot statue of Captain William Clark will be sculpted by Bob Scriver to be erected on the site. The site is being acquired by the Department of Fish, Wildlife and Parks (DFWP) with funding from Coal Tax Park Funds.

The legacy program grant would be used for construction of site facilities.

TECHNICAL FEASIBILITY ASSESSMENT

This project would support all site development costs for Clark's Lookout State Monument. These will include: a gravel access road and parking area, perimeter fences and gate, picnic facilities and latrines, benches, interpretive and directional signs, a paved foot trail, and lighting.

This project would be completed within the biennium.

FINANCIAL ANALYSIS

Total Project Cost		$403,399
Funding Sources	Amount	
1. Legacy	$142,760	site development
2. Applicant	40,739	acquisition (Parks Coal Tax)
3. Local Donations	219,000	statue
Total Funding Contributions		$403,399

The legacy program grant would be used for monument site development. The private donations and money made through the sale of miniature statue replicas of Captain Clark would be used to establish a statue on the site. Acquisition of the park site is currently underway using the Park's Coal Tax funds set out through the 1983 Legislature.

The specific budget for site development is reasonable and well planned. It is difficult, however, to visualize $220,000 being spent on constructing a 10' high statue.

ENVIRONMENTAL IMPACT ASSESSMENT

No long-term adverse environmental impacts are anticipated as a result of this project. After final project design is complete, an assessment of short-term construction impacts could be done.

PUBLIC BENEFITS ASSESSMENT

The future users of the Clark's Lookout State Monument would certainly benefit from this project. Additionally, the general public would benefit through the protection and improvement of an important historical and recreational site.

RECOMMENDATION

A grant of up to $142,760 is recommended for this project subject to the following conditions:

1. that design, construction plans, scope of work, and budget are approved by DNRC,

2. that proof of other funding is committed to complete the job, and

3. that bids are approved by DFWP and DNRC.

APPLICANT NAME: East Bench Irrigation District

PROJECT/ACTIVITY: McHessor-Dry Gulch Gravity Irrigation Project

GRANT AMOUNT REQUESTED: $ 697,295

TOTAL PROJECT COST: $1,503,595

PROJECT DESCRIPTION

Continued increased energy costs, periodic power outages, and down time for pump repairs have prompted a group of ranchers on the East Bench canal in Madison County to have a gravity irrigation system designed. The proposed project would convert 346 acres of isolated native rangeland parcels to sprinkler irrigation and convert 2,300 acres of pump sprinklers to gravity flow irrigation. This would require about 6.9 miles of underground pipe with associated metered turn-outs, valves, junctions, etc.

TECHNICAL FEASIBILITY ASSESSMENT

The project was designed and will be administered by the Soil Conservation Service (SCS). The design is a basic system of pipes sized to deliver adequate quantities of water to specified points under appropriate pressures. The main lines would be buried and metered turn-outs would be installed. Ample head is available from the main to operate the system, water supply is adequate, and additional water is available for the new lands being irrigated.

FINANCIAL ANALYSIS

Total Project Cost		$1,503,595
Funding Sources	Amount	
1. Legacy	$697,295	
2. Applicant funds	90,300	
3. SCS Technical Services	96,000	
4. Water Development Loan, DNRC	620,000	
Total Funding Contributions		$1,503,595

Project costs are standard prices as determined by the SCS and Headwaters Resources Conservation and Development group in a report published January 1984. Total development cost is $569 per acre, which is high. However, this cost is justified because the consistent supply of irrigation water would increase yield, new land would be brought into production, and electrical costs would be saved.

Other funds for the project of $186,300 would be in the form of in-kind services provided by the SCS in engineering, design, and inspection, and by the landowners for administration.

The applicant has attempted other financing sources, but all have failed. This combination funding would allow for loan repayment of approximately $20 per acre per year if the loan is made at six percent interest. This rate per acre is the request of the applicant to maintain sound ranch operating expense levels.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would create no appreciable changes in the environmental climate of the area. Negative changes would be almost nonexistent even during construction and positive changes would result from the improved vegetative cover on 346 acres of low-condition native rangeland.

PUBLIC BENEFITS ASSESSMENT

The direct benefits of the project would be to seven family farms as owners of the 2,646-acre project, with lesser benefits to the farmers operating 20,000 acres of irrigated lands under the East Bench canal. The major public benefit would be water savings from more efficient use. SCS has determined an overall savings of 2,400 acre-feet of water annually, which returns to the Beaverhead River tributaries for use by agriculture, industry, and the public. Construction of the project would generate jobs in the local area over a six-month period. Increased income would be converted into goods and services benefiting the overall local economy.

RECOMMENDATION

A grant of up to $697,295 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana State University, Agricultural Research Center

PROJECT/ACTIVITY: Use of Safflower Oil in Alternative Fuel Production

GRANT AMOUNT REQUESTED: $200,564

TOTAL PROJECT COST: $293,254

PROJECT DESCRIPTION

Safflower oil appears to have great promise as an alternate fuel for agricultural production in Montana. This fuel could alleviate dependency on fossil fuels in the event of a fuel shortage and could possibly provide energy self-sufficiency for Montana farmers. Use of only ten percent of the crop acreage for oilseed production could make Montana's agriculture industry nearly self-sufficient. The cost of using safflower oil as a fuel is currently estimated at $2.47 per gallon.

The Montana State University (MSU) Agricultural Research Center is proposing a research project that could result in development of safflower oil and co-products which would make vegetable oil fuel production economically

feasible and help stabilize Montana's agricultural economy. The proposal involves development of desirable safflower genetic lines and performance testing of new safflower oil varieties. Additional research and development beyond the proposed study would be required to realize the expected benefits.

TECHNICAL FEASIBILITY ASSESSMENT

The problem identified is to find a renewable substitute diesel fuel or extender that is Montana-specific.

The project would be a combination of study areas identified in DNRC's report titled "Montana Research Resources: Vegetable Oil as Diesel Fuel," November 1984. The report (especially Appendix V) was reviewed by the U.S. Department of Agriculture. This project identifies the first steps toward developing safflowers as an energy crop. Montana, as the second biggest safflower oil producer in the United States, produces over 30 percent of the nation's food-grade safflower oil. Ironically, the species of safflower with the largest yield (gallons/acre) is not grown for food use because it is dark in color. Therefore, the food-versus-fuel problem with other crops is not a problem with safflowers.

Additionally, the safflowers grown are high in linolenic and oleic acids; fuel use favors high oleic fatty acid oil content. Breeding for one specific fatty acid should result in a safflower oil that could be modified for fuel consumption more readily than other vegetable oils used for industrial purposes.

The final product would be a breeding plan for increasing oleic acid content and increasing by-product value. This plan would benefit the alternate diesel fuel area, and wheat farms that could use safflower as a crop addition. Burlington Northern and Southern Pacific-Santa Fe railroads have shown an interest in developing vegetable oils as diesel fuel. Burlington Northern has offered engine testing of possible fuels (letters of July 5, 1983 to Laurence Siroky of DNRC). Burlington Northern and the National Science Foundation are cooperating in current DNRC "vegetable oil as diesel fuel" projects.

Montana agriculture would benefit if a large fuel market for vegetable oil can be found. Railroads use about 30 percent of all diesel fuel consumed in-state. Composition problems of vegetable oil in diesel engines are reduced in medium-speed diesel engines, such as railroad and electric generator diesels. On-farm use would not be far behind; others are researching in this area.

FINANCIAL ANALYSIS

Total Project Costs		$293,254
Funding Sources	Amount	
1. Legacy	$200,564	
2. Applicant	73,240	
3. Other	19,450	
Total Funding Contributions		$293,254

Cost estimates appear realistic. Additional funding may be necessary to carry on the work. Other (federal) funding sources may be available after initial funding if the project contact is structured to cooperate with their activities and objectives.

The project could be completed within the biennium. A follow-up project (actual breeding) may take longer.

ENVIRONMENTAL IMPACT ASSESSMENT

There are no short-term environmental impacts associated with this project. The long-term environmental impact is favorable because it would develop another rotation crop for wheat farmers.

PUBLIC BENEFITS ASSESSMENT

The proposed project may result in increased renewable resource production of vegetable oils and decreased dependence on fossil fuel production. The benefits would initially accrue to the scientific community involved with vegetable oil production. Montanans could ultimately benefit through a stable agricultural economy and increased production of renewable resources.

RECOMMENDATION

A grant of up to $200,564 is recommended contingent on DNRC approval of the project scope of work, budget, and documented commitment of other funding sources. This recommendation will not remain in effect if the proposed project is funded under the current grant application to the DNRC Energy Division.

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APPLICANT NAME:	Montana State University, Institute of Natural Resources
PROJECT/ACTIVITY:	Demonstration of the CLAIM-II Computerized Coal Mine Reclamation Planning System
GRANT AMOUNT REQUESTED:	$87,048
TOTAL PROJECT COST:	$87,048

PROJECT DESCRIPTION

The Montana State University Institute of Natural Resources recently developed a computerized coal mine reclamation planning system called CLAIM-II. The system is designed to make many of the same calculations that a land manager would make in preparing a reclamation plan for a surface coal mine. Although the system has undergone extensive testing at Montana State University (MSU), it has not been used to prepare reclamation plans using actual mine site conditions. The purpose of this project application is to demonstrate and evaluate the usefulness of this system for reclamation planning by collecting and processing data from operating mines. The resulting computerized reclamation plans could then be compared to actual reclamation plans to verify the computer system. The product of the proposed

project would include provision of the CLAIM-II system to the Department of State Lands; the Federal Office of Surface Mining; and three mine operators who cooperated in the demonstration effort.

TECHNICAL FEASIBILITY ASSESSMENT

The applicant has indicated that the verified CLAIM-II program could be used to meet four significant needs as follows: 1) need for improved planning efficiency, 2) need to avoid reclamation plan failures, 3) need to speed up the reclamation permitting process, and 4) need for speeding up and standardizing the evaluation of public lands for coal tract leasing. The computer system is capable of providing an evaluation of a variety of reclamation land use options, reclamation techniques, cost estimates, and spoils grading calculations. The proposed demonstration and verification of the program would use data acquired directly from mine operators. The program results would then be evaluated and modified according to recommendations from the mine operators and the Department of State Lands (DSL). These parties would then receive copies of the system for their use.

The approach of field testing of this computer simulation is a necessary step in gaining the acceptance of the mining industry and the regulatory agencies. However, the need for this particular system is uncertain. Mining companies currently use their own computer models for various aspects of reclamation planning. There is no information to relate this system to other existing programs. Also there is a general feeling from both industry and government that the stated needs are too complex to be met by a computer program. Although this system may be a useful tool, considerable research and professional judgement is required for each individual reclamation project. The earthwork calculations and bond requirement calculations are two capabilities that would be valuable to DSL. Other functions such as prioritization of land use options may be unable to replace today's standard practice.

The base CLAIM-II system was developed at MSU in cooperation with the U.S. Forest Service over a six-year period. The proposed demonstration phase is scheduled to require 19 months.

FINANCIAL ANALYSIS

Total Project Costs		$87,048
Funding Sources	Amount	
1. Legacy	$87,048	
2. Applicant	-0-	
Total Funding Contributions		$87,048

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no direct environmental impacts associated with the computer system demonstration. If successful, the system could result in enhanced mine permitting and reclamation plans. If unsuccessful, the system would not be accepted by either industry or government.

PUBLIC BENEFITS ASSESSMENT

The computer program could benefit the coal mining industry and the mining regulatory agencies. The system could provide standard reclamation analysis techniques and speed the permit process. The overall result would appear to provide the greatest benefit to private industry, through cost and time savings in reclamation planning.

RECOMMENDATION

A grant of up to $87,048 is recommended contingent on DNRC approval of the project scope of work and budget. The grant funds will be available only for verification of the components of the CLAIM-II computer program that support calculation of reclamation earthwork quantities and calculation of reclamation bonding requirements. The remainder of the proposed computer program verification project should be eliminated unless DSL determines that a need for the capabilities or funding is acquired from other sources such as the mining industry.

PROJECTS NOT RECOMMENDED FOR FUNDING
(ARRANGED IN ALPHABETICAL ORDER
ACCORDING TO PROJECT APPLICANT)

APPLICANT NAME: Antelope County Water and Sewer District

PROJECT/ACTIVITY: Construction of a Sewage Collection and Treatment System for Antelope

GRANT AMOUNT REQUESTED: $167,472

TOTAL PROJECT COST: $398,947

PROJECT DESCRIPTION

The community of Antelope has 45 residences or places of business, all of which currently use individual septic tank systems for waste disposal. The use of septic tanks presents a severe health problem because tight clay soils do not readily accept sewage effluent. The septic tanks require frequent pumping, often onto the surface or into borrow pits, and in the winter, frost makes the drainfields useless.

The community is proposing to develop a new sewer facility, which would include a two-cell total retention lagoon, lift station, 8-inch gravity collector mains, and 4-inch service lines. A county water and sewer district has been formed to finance the project. The Environmental Protection Agency Construction Grant program has committed a grant amount of 75 percent of the project cost with some elements eligible for an 85 percent grant. The total award is expected to be about $240,000. A Farmers Home Administration loan for $100,000 is scheduled for the local share of the project required by the EPA program. The grant proposal to the legacy program is intended to replace the loan and to absorb other costs of the project such as legal fees, engineering and inspection fees, and land acquisition costs. The District contends that the population growth which precipitated the problem is a result of oil development. It feels that the transitory characteristics of this population could result in an extraordinary financial burden on the permanent residents if long-term debt is used to pay the local share of the project costs.

TECHNICAL FEASIBILITY ASSESSMENT

The major funding agency for the project, the Environmental Protection Agency (EPA), requires that a "Facility Plan" be completed for the project that describes the technical problems, the alternatives considered, and the most cost-effective solution. A "Facility Plan" for Antelope was completed and submitted to the Water Quality Bureau of the Montana Department of Health and Environmental Sciences, which administers the EPA program, in July 1984. The Water Quality Bureau must also approve the final designs and specifications for the system.

FINANCIAL ANALYSIS

The $398,945 project cost includes all construction costs and other costs associated with a major construction project for which a financing entity must be established. The budget also specifies costs that are not eligible for the EPA grant participation.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would provide positive environmental impacts by eliminating pumping of septic tanks onto the surface and seepage of sewage into the ground water.

PUBLIC BENEFITS ASSESSMENT

The benefits from this project would include disease prevention and improved water quality.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Chouteau County Conservation District

PROJECT/ACTIVITY: Teton River Eliminate Spurge Program

GRANT AMOUNT REQUESTED: $147,006

TOTAL PROJECT COST: $151,240

PROJECT DESCRIPTION

Leafy spurge was first identified along the Teton River in the 1940s and has since heavily infested the Teton drainage. Although leafy spurge can be found to some extent all along the Teton, the lower stretch is infested the worst. The Teton flows into the Marias and one more mile farther downstream the Marias flows into the Missouri, so leafy spurge is now affecting three river drainages and many landowners.

Landowners spent a considerable amount of time and money to control the weed from the 1950s through the 1970s, but individuals working independently within legal boundaries have not been able to control the spread of this noxious weed. The scattered efforts of a few landowners were further aggravated by flooding in 1964 and 1975. The flooding reseeded areas that were being controlled. A former gravel extraction and concrete batch plant operation along the Teton has also created a favorable environment for leafy spurge. Abandoned buildings and machinery interwoven with disturbed sites have allowed the weed to take over on state-owned land. At the time the operation ceased, there were no regulations dealing with cleanup of such a site.

The Chouteau County Conservation District proposes to establish a pilot project on approximately 1,000 acres owned by four landowners. The project would involve using chemical, biological, and sheep-grazing methods to control the spread of leafy spurge.

TECHNICAL FEASIBILITY ASSESSMENT

Of the 1,000 acres to be controlled, 100 acres in the middle of the project area would be used for sheep grazing. The landowner has agreed to cooperate with this portion of the project.

The biological control efforts would be the use of hawkmoths with the cooperation of the Western Agriculture Research Center. No commitment has been made from the Western Agriculture Research Center. Use of the hawkmoth has not yet proved to be an effective control, and over-wintering of the moths has been a problem.

Chemical control with Tordon liquid and pellets would be used most extensively in the project area. Four-wheel, all-terrain vehicles equipped with sprayers and spreaders would be used to apply both spray and pellets. Reviewers feel the Tordon concentrations and cost estimates per acre may be excessive.

Some areas where trees are present would require rope wick applicators. The landowner involved would be responsible to see that his land was being treated correctly. Although he would delegate many responsibilities to the supervisor as his direct employee, the application license covering the activity would still be the landowner's. No weed inventory of the area has been conducted.

The applicant proposes to monitor the water quality of the river to assess impacts from the use of Tordon. Reviewers question whether the project area may be too close to the river to safely apply the herbicide. Monitoring would not prevent a contamination problem, but would merely identify one if it occurs.

The chemical application would take place during about 50 days of active plant growth centered in June. At the end of the project, the purchased equipment would be given to the four landowners within the project area so that they will be equipped to continue the application at their own expense until the leafy spurge is controlled. This pilot project will have initiated spurge control on this 10-mile stretch of river bottom. The control approach is not basinwide, nor is there a specific plan for follow-up effects or weed control monitoring. If landowners upstream do not control weeds, the results from this project would be minimal.

The state-owned lands involved would require reclamation from a past gravel extraction operation. This would involve the removal and cleanup of old buildings and machinery, and would be followed with grass seeding and introduction of the hawkmoth.

A chemical supplier would also test a chemical fertilizer mix on a test plot for leafy spurge control. No details of this project have been submitted.

FINANCIAL ANALYSIS

Total Project Cost		$151,240
Funding Sources	Amount	
1. Legacy	$147,006	
2. In-kind Services	4,234	
Total Contributions		$151,240

In-kind services totalling $4,234 would be provided by Soil Conservation Service (SCS), local landowners, County Extension Service, County Weed Board and the chemical fertilizer supplier.

Personnel costs for a project supervisor, laborers, and resource consultant for the water testing would be $10,700. Tordon pellets and spray chemicals would total $76,000. Equipment costs would be $24,350. This includes $21,600 for chemical application equipment which would be given to the landowners after the project is completed. Fuel costs would be $1,680. Grass seeding and cleanup of the gravel operation site would be $14,000. This is an estimate only. Inflation and contingency would add $20,277 to the project costs.

Cost estimates appear excessive throughout the project. The Department of State Lands has agreed to cooperate with the project but would not provide direct funds. State personnel may be able to provide the services of the hired consultant. Landowners should contribute more directly to control costs.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled infestations of leafy spurge can adversely affect the environment through loss of native vegetation resulting in erosion, stream sedimentation, loss of fish and wildlife habitat, and loss of forage and agricultural crop land. Adverse environmental impacts can also result from the improper use of Tordon. If Tordon label instructions are specifically followed, and only licensed applicators apply the chemical, the adverse environmental impact from this project should be minimal. Consequently, the longer-term environmental impacts could be positive, by controlling the spread of the leafy spurge infestation. These positive effects, however, would last only as long as effective control methods are continued or until the leafy spurge infestations are eliminated.

PUBLIC BENEFITS ASSESSMENT

The state's renewable resources may be protected through the control of leafy spurge. Primary benefactors would be the four landowners on whose land the control methods take place, and who receive all the spray equipment at the end of the project. Because this proposal does not take a basinwide approach to the problem, nor provide for a weed inventory and positive management plan, positive benefits from the project may be short-term. Some spreading of the weed infestation downstream may be prevented.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Fort Belknap Community Council

PROJECT/ACTIVITY: Fort Belknap Abandoned Mine Tailings Project

GRANT AMOUNT REQUESTED: $1,173,750

TOTAL PROJECT COST: $1,181,250

PROJECT DESCRIPTION

Past gold mining and milling operations in an area called King Creek, located on the northwest end of the Little Rockies, are causing water quality and related problems in area streams. King Creek is a tributary to Little Peoples Creek, which is a major drainage on the Fort Belknap Indian Reservation. Tailings have apparently been eroding into King Creek since the 1930s and creating water quality problems since that time. A sedimentation dam, called Cumberland Dam, was built in King Creek in the early 1970s to catch eroded tailings. In 1974 the dam washed out and was rebuilt in 1975. The present dam was reported by the applicant to be filling quite rapidly with tailings and to have questionable remaining capacity. In addition, the applicant indicates that evaluations of the dam found several deficiencies that could possibly lead to a failure of the dam. If the dam failed, large amounts of tailings would be washed into the drainage with potentially disastrous effects on water quality and the environment in general.

The applicant proposes to design and construct a new sedimentation dam in the vicinity of the present Cumberland Dam to catch eroded tailings. The dam would be designed and constructed in accordance with current standards.

TECHNICAL FEASIBILITY ASSESSMENT

It is technically feasible to design and construct a sedimentation dam to trap eroded tailings. The location of the dam and tailings would, however, appear to be on private property and questions regarding permission to construct the structure, identifying the responsible party, and deciding who should pay for the structure remain unanswered. In addition, the Montana Department of State Lands (DSL) indicates that the private landowner has recently removed the majority of tailings from the site. Also, tailings were apparently removed from Cumberland Dam and the dam spillway was replaced. DSL feels that the problems in the area have been solved.

FINANCIAL ANALYSIS

Total Project Costs		$1,181,250
Funding Sources	Amount	
1. Legacy	$1,173,750	
2. Applicant	7,500	
Total Funding Contributions		$1,181,250

The budget includes $7,500 for contract administration, $186,000 for professional/technical services, $744,000 for construction, and $243,750 for contingencies.

ENVIRONMENTAL IMPACT ASSESSMENT

If the project were completed as proposed, a positive environmental impact would probably result, although the dam construction activity would have unavoidable short-term adverse impacts on water quality.

PUBLIC BENEFITS ASSESSMENT

The project would provide for mined land reclamation. The primary benefactors of this project would be the residents of the Fort Belknap Indian Reservation. Improved protection of the King Creek, Little Peoples Creek, and Little Rocky Creek water quality would compensate for damages caused by resource development.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Granite, Jefferson, Madison, and Butte-Silver Bow Counties

PROJECT/ACTIVITY: Southwest Montana Cooperative Noxious Weed Control

GRANT AMOUNT REQUESTED: $291,771

TOTAL PROJECT COST: $635,526

PROJECT DESCRIPTION

Noxious weed infestations are increasing in every county in Montana. The rangelands of Silver Bow County surrounding Butte are heavily infested. Spotted knapweed alone infests two million acres, and is spreading at a rate of 27 percent per year. Due to this rate of spread, local governments' and landowners' economic capacity to respond is severely strained. Weed seeds spread back and forth between various landownerships, making it impossible for any one agency or landowner to treat the problem. It is clear that the solution to the noxious weed problem would require the cooperative efforts of federal, state, and county governments, as well as industrial and private landowners.

Four counties, their respective weed boards and conservation districts, and five towns have joined together to overcome this problem. The lead public entities in these projects are the Granite, Jefferson, Madison, and Butte-Silver Bow County Weed Boards, and the Granite County Weed Control District. The weed boards are responsible for the control of noxious weeds in the counties and have trained personnel to carry out their duties. The applicants propose to control noxious weeds in specific areas in each of the counties to demonstrate the effectiveness of such a cooperative approach and to promote similar efforts. These areas are described below.

Granite County Project. This project proposes to control noxious weeds in a 35-square-mile area, including the town of Philipsburg. The project would be a cooperative effort involving the Granite County Weed Board, Conservation District, private landowners, the town of Philipsburg, and the Montana Department of Highways. The Weed Control District is also seeking cooperation by the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the Montana Department of State Lands (DSL).

The Granite County Project would address noxious weeds on all roads, rights-of-way, agricultural, and other lands, with special emphasis on mine dumps, sanitary landfills, sewage lagoons, and vacant lots within the town of Philipsburg. Site limitations would require extensive hand labor. Partial funding for labor, equipment, and chemicals to augment this effort is requested in the grant.

Jefferson County Project. The objective of this project is to control noxious weeds in a 70-square-mile area in and around the town of Boulder. The project would be a cooperative effort involving the Jefferson County Weed Board, Conservation District, private landowners, the town of Boulder, BLM, USFS, Boulder River School and Hospital, Montana Department of Highways, DSL, Jefferson County High School, and Dow Chemical Company.

The weed board would provide labor, equipment, and chemicals to treat all highways, county roads, county yards, and the school district land. Funding for treating highway rights-of-way would be provided through a contract with the Montana Department of Highways. In exchange for the control on school district lands, the Boulder High School would participate in weed control education activities. The county has agreed to make available the necessary labor and equipment on Boulder River School and Hospital land. The school would cover the chemical, labor, and equipment costs.

Madison County Project. The objective of this project is to control noxious weeds in a 62-square-mile area up to and including the towns of Ennis and Virginia City. The project would be a cooperative effort involving the Madison County Weed Board, Conservation District, Ruby Valley Conservation District, private landowners, the towns of Ennis and Virginia City, DSL, BLM, USFS, and Montana Department of Fish, Wildlife and Parks (DFWP).

The weed board would provide labor, equipment, and chemicals to treat all highways, county roads, and county yards. Funding for treating highway rights-of-way would be provided through a contract with the Montana Department of Highways.

Butte-Silver Bow County. The objective of this project would be to control noxious weeds in a 79-square-mile area from one mile north of the Continental Divide to Melrose. The project would be a cooperative effort involving the Butte-Silver Bow Weed Board, private landowners, USFS, DFWP, Stauffer Chemical, BLM, Montana Department of Highways, DSL, Union Pacific Railroad, and Butte Water Company.

The County of Butte-Silver Bow would provide technical assistance of county weed foreman, labor, equipment, and chemicals to treat all highways, county, and state roads in the project area, and provide some equipment at no cost for use within the project area by landowners. Funding for treating highway rights-of-way would be provided by the Montana Department of Highways. Office space and equipment necessary for project administration would be provided through the Cooperative Extension Office and the Butte-Silver Bow Weed Board.

Each area within the four counties would have an intensive survey of the weed species, their distribution and density before starting the control. After the areas have undergone intensive control measures, the cooperating agencies and groups would determine the distribution and density of noxious weeds in the treated areas. Each of the cooperating agencies or groups would be responsible for carrying out a certain portion of the project. Tours and workshops would be conducted each year of the program to review the project and its impact, and provide information on all weed control methods. The areas would be designated by large signs on each of the highways and roads entering the project area. A final report would be completed by the Jefferson, Madison, and Butte-Silver Bow County Weed Boards, and the Granite County Weed Control District.

TECHNICAL FEASIBILITY ASSESSMENT

The concept of selected control areas was chosen after looking at the complexity of developing a coordinated weed plan for an entire county. The areas selected are centrally located in the counties, highly visible, and the majority of the entities concerned with weed control would be participating.

The areas involved in this project are located in the part of Montana that historically has been the center of mining. The presence of waste areas created by this activity aggravates the spread of noxious weeds. Such areas would be addressed in each project. Exact locations and weed infestations have already been identified and targeted in the Jefferson and Madison County projects. Intensive mapping efforts in Granite and Butte-Silver Bow would locate similar areas.

Chemical control would be the major method used. The selection of chemicals and rates would be on Montana State University (MSU) weed specialists' recommendations for adequate control at lowest possible cost. A spray clinic would be held each year for sprayer calibration in the project areas.

On those areas where landowners object to the use of chemicals or chemical use is restricted due to site limitations, cultural practices or other measures would be taken to comply with the Montana Weed Law. Release sites for knapweed gall flies would be set up in each of the project areas.

The projects would be reviewed monthly by their respective weed boards. Project committees made up of cooperators would be asked to update the weed boards at their monthly meetings to resolve problems or take advantage of opportunities that could arise.

Twice a year a technical advisory committee made up of the agency personnel involved and MSU range and weed specialists would be requested to review each area's progress and make recommendations to the responsible weed board.

The areas would be designated by large signs on each of the highways and roads entering the project area. Tours and workshops would be conducted each year of the program to provide training in chemical and management techniques for weed control plus review the project and its impact. The projects would be completed in two years.

Private landowners would be required to sign a cooperative agreement to begin carrying out weed control on their property. Whenever possible, landowners would provide necessary equipment for control. Additional equipment would be available from the county and, where available, the Conservation District. The counties would make arrangements for the necessary

chemical with the grant funds. Based on acreage mapped, landowners in the project area would be eligible to obtain the required amount of chemical. The landowner would cover 25 percent of the chemical cost and total application costs.

The towns of Boulder, Ennis, and Virginia City would be responsible for control of noxious weeds within city limits. The towns would provide necessary labor, equipment, and 25 percent of the chemical costs. The grant would provide the remaining amount.

BLM and USFS would be requested to carry out the necessary control measures on land each manages in the project areas. Similar requests are being made to other land-holding entities.

In the Jefferson County Project Area, DSL has agreed to provide an initial detailed inventory and map of noxious weeds on state-owned land tracts involved. They would notify lessees of any noxious weed locations, prescription for control, required action in accordance with lease agreement, and the coordinated project. DSL will provide four routed wooden roadside signs, installation and maintenance for the project, and followup on the mapping and control by landowners for three years. In addition, the weed board plans to request that DSL cost-share 75 percent of the cost of control on state lands, or provide other in-kind assistance. The Granite, Madison, and Silver Bow County Projects are making similar requests to DSL.

Each county would be responsible for implementation and administration of their respective projects. For Jefferson, Madison, and Butte-Silver Bow, the weed boards would be the lead entities. In Granite County, the Granite County Weed Control District would be the responsible entity, accountable to DNRC. Separate grant contracts would have to be negotiated for each county.

Cooperative weed control programs like the ones proposed are much more effective than piecemeal approaches to controlling weed infestations, making the cooperative approach the preferred alternative. Chemical control measures have been effective in containing noxious weeds to an area, but the measures do not provide long-term solutions to the problem.

FINANCIAL ANALYSIS

Granite County Project

Total Project Costs	$154,381

Funding Sources	Amount
1. Legacy	$61,439
2. Granite County	12,100
3. Philipsburg	38,930
4. Private Landowners	48,312
5. MT Dept. of Highways	3,600
Total Funding Contributions	$154,381

Legacy contributions would purchase chemicals at $39,351 and equipment at $6,600. Administration costs would amount to $5,500, mapping costs would be $1,250, and inflation contingency would add $8,738 to the project cost.

Total chemical costs for the project would be $58,068. Total labor and equipment charges would total $77,575.

Since these figures were based on weed acreages estimates and cost estimates, it is not possible to determine if the budget proposed is adequate and reasonable. More accurate figures will be available after the weed inventory is conducted.

Jefferson County Project

Total Project Costs $160,320

Funding Sources	Amount
1. Legacy	$84,635
2. Jefferson County	3,993
3. Boulder	925
4. Private Landowners	43,804
5. MT. Dept. of Highways	12,273
6. MT Dept. of State Lands	3,535
7. State Lands Leasee	1,454
8. Boulder River School and Hospital	1,732
9. Jefferson Valley Conservation District	7,971

Total Funding Contributions $160,320

Legacy funds would provide $70,209 for chemicals, $4,850 for administration, $500 for materials and $9,075 for inflation contingency. Total costs for chemicals would be $105,593. Labor and equipment costs would total $31,003.

Cost estimates for this project are based on weed mapping information plus ten percent. Costs appear adequate, but slightly high.

Madison County Project

Total Project Costs $201,325

Funding Sources	Amount
1. Legacy	$92,392
2. Madison County	16,189
3. Ennis	2,345
4. Virginia City	1,730
5. Private Landowners	47,701
6. U.S. Forest Service	500
7. MT Dept. of State Lands	7,180
8. State Lands Leasee	5,040
9. Soil Conservation Service	5,500
10. Bureau of Land Management	22,748

Total Funding Contributions $201,325

Legacy funds would provide $59,364 for chemicals, $14,050 for labor and equipment, $500 for materials, $7,082 for administration, and $11,396 for inflation contingency. Total costs for chemicals would be $103,218. Equipment and labor costs would be $69,738.

The weed species acreage is based on input from major landholders in the project area, Soil Conservation Service, Extension Service, and county weed foreman. These estimates would be refined after an intensive survey in each of the project areas is conducted. It is not possible to determine if the estimates are adequate and reasonable.

Butte-Silver Bow County Project

Total Project Costs	$126,670

Funding Sources	Amount
1. Legacy	$73,170
2. Butte-Silver Bow County	6,000
3. Private Landowners	33,500
4. MT Dept. of Highways	8,000
5. MT DFWP and MT Dept. of State Lands	2,000
6. BLM and U.S. Forest Service	2,000
7. Union Pacific Railroad	2,000
Total Funding Contributions	$126,670

Legacy funds would provide $33,500 for chemicals, $28,500 for labor and equipment, $4,000 for materials and mapping, and $7,170 for inflation contingency. Total costs for chemicals would be $53,300, and total costs for labor and equipment would be $60,200.

The weed species acreage is based on input from landowners, Soil Conservation Service, Extension Service, and the county weed foreman. These estimates would be refined after an intensive survey in each of the project areas is conducted. It is not possible to determine if the estimates are adequate and reasonable.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled noxious weed infestations could result in long-term negative environmental effects in the form of loss of productive agricultural and forage lands, soil and wind erosion, and loss of wildlife habitat. Short- and long-term adverse environmental impacts to water quality, public health, and wildlife could also occur from improper use of chemical control measures. With proper application of chemicals and other control measures, these negative effects could be prevented and weeds could be controlled from spreading, resulting in positive environmental impacts.

PUBLIC BENEFITS ASSESSMENT

These projects would protect Montana's natural resources through weed control and would aid in reclaiming areas disturbed by past mining. The primary benefactors would be the residents within the project area. All Montanans would benefit from a reduction in noxious weed seed sources and infestations. These benefits would result only if long-term control efforts in these areas are continued.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Lewis and Clark County Conservation District

PROJECT/ACTIVITY: Agricultural Land Project for Lewis and Clark County

GRANT AMOUNT REQUESTED: $35,740

TOTAL PROJECT COST: $35,740

PROJECT DESCRIPTION

In response to the continued threat of farmland conversion in Lewis and Clark County, a study was funded in 1983 to develop a voluntary agricultural land conservation program for the county. This program was published as a report in 1984.

As follow-up to the recommendations in that report, the Lewis and Clark County Conservation District (CD) is sponsoring a project to perform prime farmlands mapping and land evaluations in the county. This work is necessary before a voluntary land trade or development rights purchase program can be started to protect important farm and natural resource lands.

TECHNICAL FEASIBILITY ASSESSMENT

The project includes three phases. Phase I is Prime Farmlands Mapping. The state Soil Conservation Service (SCS) office would designate prime lands and lands of state-wide significance. Lands of local significance would be designated by the CD with assistance from a consultant.

Phase II would further detail the inventory through application of the Land Evaluation and Site Assessment System (LESA), a process required by the Farmland Protection Policy Act. This would assist in determining which lands would qualify for a purchase of development rights strategy.

Phase III would further refine the County Lands Inventory to determine which lands are desirable for development or purchase, which have unique value, which fit a pre-specified purpose, and which have little value. As part of the third phase of this two-year project, recommendations would be made to the county regarding development of an ongoing land conservation project.

Application of the results of this project are not documented in the proposal.

FINANCIAL ANALYSIS

Total Project Costs		$34,740
Funding Sources	Amount	
1. Legacy	$34,740	
Total Funding Contributions		$34,740

Nearly all costs associated with this project are personnel-related. The costs described in the budget seem very reasonable.

ENVIRONMENTAL IMPACT ASSESSMENT

No environmental impact will occur directly as a result of this project. Indirectly, this project could be very helpful in decreasing possible impacts of some land-use decisions.

PUBLIC BENEFITS ASSESSMENT

The results of this project could be very helpful in making land-use decisions in Lewis and Clark County. This project could also be used as a model for work needed in other parts of Montana. This work could benefit all citizens of Montana in addition to county residents by helping to promote wise use of land and water resources.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Lewis and Clark Conservation District

PROJECT/ACTIVITY: Knapweed Containment Support Project

GRANT AMOUNT REQUESTED: $3,000

TOTAL PROJECT COST: $9,550

PROJECT DESCRIPTION

In 1984, Lewis and Clark County had about 4,500 acres of private and public land infested by knapweed. Another five percent of land may be infested in 1985 if knapweed is not controlled. An awareness program (War on Weeds) was started in 1983 to bring attention to weed problems in the county. Public interest and concern was enthusiastic. However, the county feels it does not have enough spray equipment to meet the requests for assistance from the War on Weeds program. The Lewis and Clark County Conservation District requests $3,000 for additional sprayers to support their coordinated control programs.

TECHNICAL FEASIBILITY ASSESSMENT

The sprayers would be made available on request to landowners for control purposes. The areas sprayed would be within a coordinated management area with assistance from the weed district and the County Extension Service. The weed district would maintain the equipment and make it available to the public.

The conservation district would direct the funds to the county weed board for administration.

The sprayers would be purchased within the biennium.

FINANCIAL ANALYSIS

Total Project Costs		$9,550
Funding Sources	Amount	
1. Legacy	$3,000	
2. County Weed Board	5,550	
3. Extension Service	1,000	
Total Funding Contributions		$9,550

Legacy funds would purchase two sprayers at $1,500 each. Contract administration would cost $1,500. Educational costs, office supplies, and machines would total $2,050. The county weed board would purchase two sprayers at $1,500 each. Cost estimates appear reasonable and adequate. County funds contribute to a large portion of the project.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled infestations of knapweed can adversely affect the environment through loss of native vegetation resulting in erosion, stream sedimentation, loss of fish and wildlife habitat, and loss of forage and agricultural crop land. Adverse environmental impacts can result from the improper use of chemicals. If chemical label instructions are specifically followed, and only licensed applicators apply them, the adverse environmental impact from this project should be minimal. Consequently, the longer-term environmental impacts could be positive, by controlling the spread of the knapweed infestation. These positive effects, however, would last only as long as the control methods are used or the knapweed infestations eliminated.

PUBLIC BENEFITS ASSESSMENT

This project would protect the state's renewable resources through control of knapweed. Primary benefactors would be landowners on whose land the control efforts take place. Montana citizens would benefit from reduced knapweed infestations.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Lewis and Clark Conservation District

PROJECT/ACTIVITY: Noxious Weed Inventory and Mapping Project

GRANT AMOUNT REQUESTED: $101,225

TOTAL PROJECT COST: $101,225

PROJECT DESCRIPTION

A noxious weed problem exists in Lewis and Clark County, but the nature and extent of this problem is undefined. Weed control districts have never adequately addressed inventories of noxious weed populations. Maps or inventories generated by supervisors are often limited in their usefulness because the maps are not specific.

This proposal would allow the Lewis and Clark County Weed District to determine the extent of the noxious weed infestations in this county by surveying private, county, and state lands for presence of fourteen plants declared noxious. This survey would generate maps of the infestations, ownership records, and gross and net acreage. Data would be keyed to legal description, landowner name, and legal landowner's tax pin number. Data would be stored for use in a personal computer to be purchased from this grant and a mainframe computer already in use by Lewis and Clark County, so that information in the system may be retrieved or updated as necessary.

Acquired inventory information would provide information on the net and gross acreages of the weed populations surveyed; a description of the responsible landowner, areas of possible environmental problems; and a historical record useful for documenting the success or failure of control programs and for monitoring areas that are newly invaded by noxious weed species. Inventory information would be used to encourage landowners to become involved in cooperative projects. Those landowners identified as contributing to the noxious weed problems of their neighbors but refusing to comply with control programs would be targeted for enforcement actions. Further inventories would be helpful during development of budget proposals for control programs.

TECHNICAL FEASIBILITY ASSESSMENT

Four upper-class University students in agriculture, botany, forestry, or range management would be hired to perform weed surveys. The students would be hired for fifteen weeks and should be able to survey fifteen townships or 540 square miles. This is about one-third of the private, county, or state lands in Lewis and Clark County. These lands would be surveyed over a three-year period. A computer system would be used to perform all of the routine activities required of the district. Data from the proposed inventory

project would also be stored and manipulated for a variety of uses in county weed control. Existing county computer storage capacity and equipment are incompatible or inadequate for storing and manipulating the weed control inventory information.

The Conservation District would direct the grant funds to the county weed board for their administration.

FINANCIAL ANALYSIS

Total Project Costs		$101,225
Funding Sources	Amount	
1. Legacy	$101,225	
Total Funding Contributions		$101,225

Secretarial services and contract administration by the county weed administrators would be $9,000. Travel, phone, and supply costs would total $12,825. Salaries and benefits for weed surveyors and data entry operators would be $59,400. Computer costs would add $20,000.

The county would not contribute direct funds to this project. Costs could be reduced if the county provided administrative and secretarial services, phone, and supplies. Computer capability would be useful for other purposes besides weed inventories. Cost estimates appear excessive for conducting a weed survey. Surveys have been completed in other counties for substantially less cost. Reviewers question the need for a computer for this project.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project. Long-term positive impacts would result from the weed inventory because it assists in beginning an effective control effort.

PUBLIC BENEFITS ASSESSMENT

This proposal would protect the state's renewable resources through inventorying weed infestations for planning weed control programs. Citizens of Lewis and Clark County and all Montanans would benefit if this project results in effective noxious weed control.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Lewis and Clark County Conservation District

PROJECT/ACTIVITY: Subcontracting Revolving Fund

GRANT AMOUNT REQUESTED: $40,000

TOTAL PROJECT COST: $63,500

PROJECT DESCRIPTION

The Lewis and Clark County Weed District receives about 400 requests each spray season to control noxious weeds on lands where landowners are in violation by falling to provide control measures. While state law gives the county the authority to do this, the county has only enough funds available to meet ten percent of these requests because of a cash flow problem.

When landowners do not control noxious weeds on their property, the county has the authority to provide the weed control and then tax the landowners for the cost of the chemicals and labor. Since the repayment of county funds does not occur until taxes are collected, commercial contractors are reluctant to provide the control because it takes too long to get paid for their services, and ties up their dollars invested in the equipment, chemicals, and labor.

The applicant proposes to set up a revolving fund to allow the establishment of an on-going subcontracting program. Dollars would be set aside to pay subcontractors after completion of a project rather than making the contractors wait until taxes are collected before they get paid. More requests for control efforts could be met, and weed infestations and seed sources in Lewis and Clark County would be reduced. As taxes are collected, they would go into the revolving account for future control efforts. More subcontractors would be available for controlling weeds.

TECHNICAL FEASIBILITY ASSESSMENT

The applicant has indicated that the present structure of the Weed District does not allow county dollars to be set aside for a revolving fund. The county weed board also feels that it cannot set aside the dollars needed for the account without jeopardizing on-going control measures.

Both of these options need to be assessed thoroughly by the applicant.

FINANCIAL ANALYSIS

Total Project Cost		$63,500
Funding Source	Amount	
1. Legacy	$40,000	
2. County Weed Board	23,500	
Total Funding Contributions		$63,500

All of the legacy funds will go into the revolving fund to be used for hiring commercial sprayers.

Of the $63,500, $3,500 is budgeted for contract administration, postage, and travel. The remaining $60,000 would go into the revolving fund.

Without having information on the number of acres to be controlled, the charges of the commercial sprayers and costs of chemicals, it is not possible to conduct a feasibility assessment of this project.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no direct environmental impacts from implementing this project.

PUBLIC BENEFITS ASSESSMENT

The project would protect Montana's natural resources through weed control. Primary benefactors would be Lewis and Clark County.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Liberty County

PROJECT/ACTIVITY: Marias River Basin Weed Control Project

GRANT AMOUNT REQUESTED: $197,468

TOTAL PROJECT COST: $247,312

PROJECT DESCRIPTION

Noxious weed infestations have been growing by 10 to 27 percent each year in the Marias River basin, and now cover 962,476 acres.

Liberty County, for Marias River Basin Weed Control, Inc., proposes to develop a coordinated management effort for the control of noxious weeds in the Marias River basin in Glacier, Liberty, Pondera, and Toole counties. Through this coordinated plan, existing weed infestations would be contained, new outbreaks of noxious weeds eradicated, leafy spurge and spotted knapweed infestations at the edge of the basin would be controlled, and demonstrations of control efforts would be held. Funds from the grant would provide supervision, technical expertise, education, cost-share funds, equipment, and personnel to private landowners for controlling weeds on their land.

TECHNICAL FEASIBILITY ASSESSMENT

The Marias River Basin Weed Control, Inc. is a nonprofit organization formed in 1983 to control noxious weeds in the Marias River basin. This organization would coordinate and direct all activities of the proposed project. Funds for this project would be provided by each county, the National Park Service, Bureau of Land Management, Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Indian Affairs, Department of State Lands, and this grant. No commitment of these funds has

yet been obtained, although most of these agencies have expressed interest in the program, and have contributed to a weed inventory and mapping project conducted for the basin in 1984. The report of that inventory is the basis for the coordinated weed management proposal.

The selected Coordinated Management Plan Alternative would be a more effective alternative than piecemeal control measures tried in the past. The project area encompasses a logical geographical area of infestation by including an entire basin rather than ending at county boundaries. Most control methods would be through the use of chemical herbicides. While chemical control can contain infestations to an area, it does not provide a long-term solution to the weed problems. To be effective, this project must continue beyond the end of the biennium.

FINANCIAL ANALYSIS

Total Project Cost $247,312
(Two years of five-year program)

Funding Sources	Amount
1. Legacy	$197,468
2. Glacier, Liberty Pondera & Toole Counties	28,000 ($7,000 each)
3. National Park Service	7,529
4. Forest Service	2,586
5. Bureau of Land Management	763
6. Bureau of Reclamation	612
7. U.S. Fish and Wildlife	86
8. Bureau of Indian Affairs	5,254
9. Montana Department of State Lands	5,014
Total Funding Contributions	$247,312

Complete commitment from all of these contributors has not yet been made.

Of the $247,312 total project cost, $72,000 would be for contract administration and capital supplies. Herbicides and labor would cost $161,312, and $14,000 would be for contingency.

Cost estimates appear reasonable; however private landowners are not cost-sharing chemicals.

It has been recommended that $46,000 from the Renewable Resource Development (RRD) program be granted for this project. DNRC Conservation Districts Division has also awarded $15,800 to this project.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled noxious weeds can spread and cause short- and long-term environmental effects such as increased soil erosion and water quality degradation. Vegetative forage would be destroyed, affecting agricultural crops and rangeland, and wildlife habitat. Long- and short-term negative environmental impacts could also affect water quality and wildlife through improper use of chemical herbicides. With proper application, however, these impacts could be minimized and the resulting containment of weed infestations would be of positive environmental impact.

PUBLIC BENEFITS ASSESSMENT

This project would protect Montana's renewable resources through weed control. Primary benefactors would be residents of the Marias River Basin. All Montanans would benefit from a reduction of noxious weed seed sources and infestations.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Little Beaver Conservation District and Fallon County Weed Board

PROJECT/ACTIVITY: Cottonwood Creek Knapweed Project

GRANT AMOUNT REQUESTED: $40,897

TOTAL PROJECT COST: $43,897

PROJECT DESCRIPTION

Approximately 700 acres of 80 percent tame grasses and 20 percent native rangeland on Cottonwood Creek in Fallon County are affected by 400 acres of Russian knapweed, intermingled with small areas of spotted knapweed. Seed has spread many miles along east-west Highway Number 12 and along a principal north-south county road. Grass production within the infested area is only 20 percent of the potential production capability of these soils. These parcels are relatively free of knapweed infestations but will not remain so if this major seed source is not immediately eliminated. Thirty percent of the surrounding area is owned by the Bureau of Land Management (BLM), an additional ten percent is owned by the State of Montana; the balance is privately owned.

This noxious weed was introduced to this site when grass was seeded in the 1960s. The original infestation of ten acres has increased to 400 acres. This knapweed was in existence before the present rancher assumed control of this land. Application of 2-4-D, burning, and breaking the native sod have been unsuccessful in controlling this weed.

The Little Beaver Conservation District and the Fallon County Weed Board propose to: (1) eradicate this knapweed infestation and eliminate the seed source, (2) increase the production of desirable vegetation, (3) restore the land values, (4) use this site as a demonstration project to show the people of southeastern Montana an effective method of controlling knapweed, and (5) improve wildlife habitat and recreational values.

The objectives would be met through the application of chemicals and development of a comprehensive range management plan.

TECHNICAL FEASIBILITY ASSESSMENT

The Cottonwood Creek Knapweed Project was selected because it would control the only large knapweed infestation in Fallon County, thereby eliminating the spread of this noxious weed to adjacent publicly-owned lands and to other portions of Fallon, Custer, Prairie, and Carter counties. Another consideration in selecting this project is its immediate proximity to Highway 12, making it accessible to the public for demonstration purposes.

The proposal for the Cottonwood Knapweed Control project is a two-part program. The first part consists of chemical treatment in late June or early July with 1.5 pounds per acre of liquid Tordon. The liquid application would be applied by ground equipment. An alternative application of the granular form of 1.5 pounds of Tordon could be applied either by ground or aerial equipment during the growing season or as a late fall treatment. Research indicates that 20 percent of the affected area would need retreatment the second year. The land owner-operator has agreed to continue treatment, in subsequent years, as necessary to comply with the Montana State Weed Law (Sec. 16-1706). Chemical treatment would be under the technical supervision of the Fallon County Weed Board. No biological or cultural methods were considered. Reviewers feel the Tordon concentration may be excessive. MSU research has shown one-half pound of Tordon to be effective against Russian knapweed.

The second part of the project uses a grazing management plan developed by the Soil Conservation Service (SCS). The present carrying capacity is estimated by SCS to be 160 animal-unit months. After reclamation of this land and good management, a potential carrying capacity of 400 animal-unit months would be reached.

The goal of the grazing plan would be developed on the operating unit (including the area infested by knapweed), by the landowner-operator and the SCS. This would be completed before starting the project. No details of the plan were submitted by the applicant.

The need for the project has been documented and a weed inventory conducted. The Little Beaver Conservation District would administer the program.

FINANCIAL ANALYSIS

Total Project Cost		$43,897
Funding Sources	Amount	
1. Legacy	$40,897	
2. Applicant	$ 3,000	
Total Funding Contributions		$43,897

Contract administration costs would be $1,250. The applicant would provide $3,000 for professional services. Labor and equipment costs would total $4,056, and chemicals would cost $31,200. Contingency and inflation would add $5,641 to the project costs. All budget items are for the weed control portion of the project. Cost estimates could be reduced substantially if Tordon concentrations were lessened. The landowner should be requested to provide a greater percentage of the control cost.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled infestations of knapweed can have a significantly adverse effect on the environment through loss of native vegetation resulting in erosion, stream sedimentation, loss of fish and wildlife habitat, and loss of forage and agricultural crop land. Adverse environmental impacts can also result from the improper use of Tordon. However, if Tordon label instructions are specifically followed, and only licensed applicators apply the chemical, the adverse environmental impact from this project should be minimized. Consequently, the longer-term environmental impacts could be positive, by controlling the spread of the knapweed infestation. These positive effects, however, would last only as long as control methods are continued or until the knapweed infestations eliminated.

PUBLIC BENEFITS ASSESSMENT

Funding the Cottonwood Creek Knapweed Project would protect the state's renewable resources, through sound conservation practices by controlling the only large infestation of Russian and spotted knapweed in Fallon County. The project would restore the area to its most productive land-use potential, and would eliminate the threat of decreased land values and the hazard this seed source presents to surrounding land resources and watershed. Primary benefactors would be the landowner in the project area. All Montanans would benefit from the control and elimination of knapweed.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Little Beaver Conservation District and Fallon County Weed Board

PROJECT/ACTIVITY: Dugout Creek Leafy Spurge Project

GRANT AMOUNT REQUESTED: $9,161

TOTAL PROJECT COST: $9,161

PROJECT DESCRIPTION

Approximately 182 acres of the 320 acres within the Dugout Creek drainage in Fallon County are infested with leafy spurge. The size of the infestation is increasing by ten percent per year. The infested lands and adjacent land are owned by the Bureau of Land Management (BLM), absentee owners, the county, private landowners, or are state land leased to a private individual. All but the state lease lands are being controlled for leafy spurge. The terrain and geography of the state land is rough, and accessibility is difficult. The leasee of this state land parcel does not feel that he can afford to treat the leafy spurge. Productivity of this land is low, and investment by the leasee in land he does not own is not economically rational. This state land poses a noxious weed threat to adjoining lands.

The Little Beaver Conservation District and the Fallon County Weed Board request funding to control leafy spurge in this infested area and to further provide organizational, educational, and technical assistance to the Dugout Creek area as a whole to establish a leafy spurge control program on all lands in this area.

TECHNICAL FEASIBILITY ASSESSMENT

The control method to be used is chemical. Tordon 2K herbicides (Piclcram) granulars will be applied by helicopter in the fall of 1985. The proposed rate will be two pounds of active ingredient per acre (100 pounds Tordon 2K). According to reviewers these rates are excessive. Clean-up and retreatment would occur the second year in 1986. Landowner operators would agree to continue treatment in subsequent years as necessary to comply with the Montana weed law. No biological or cultural control methods would be used. This infestation is at least 25 years old and control methods in the past have been unsuccessful in controlling this problem.

Private landowners and the Fallon County Weed Board worked with a helicopter application and treated 828 acres of leafy spurge by this method in 1984. Experience indicates this method to be most feasible in the rough terrain of the proposed project area.

The landowners surrounding the state land have indicated a willingness to participate in a total leafy spurge control program for this area. A total program of this nature depends on a control program on these state lands.

Dugout Creek flows into North Dakota and through Horse Creek Grazing Association land. The Grazing Association is pursuing an active, leafy spurge control program. The Montana side of Dugout Creek presently contributes to their problem.

This project will provide an opportunity for the federal, state, and county governments to work together with local and absentee owners, and an opportunity for all to protect the land resource base.

The Conservation District would administer the grant funds, and the Weed Board would provide the control work. A weed inventory has been conducted, proving the need for control in the area.

FINANCIAL ANALYSIS

Total Project Cost		$9,161
Funding Sources	Amount	
1. Legacy	$9,161	
2. Applicant	-0-	
Total Funding Contributions		$9,161

Administrative costs would be $1,100 and labor would be $1,000. Equipment rental would cost $525, and chemical costs would be $5,232. Inflation and contingency would add $1,304 to the project cost. Budget figures appear adequate and reasonable.

According to the applicant, the Department of State Lands (DSL) has been unwilling to provide funds for control on the state-owned lands. No other funding sources were identified. The county would cost-share on the chemicals if the landowner also contributed.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled infestations of leafy spurge can have a significant adverse effect on the environment through loss of native vegetation, resulting in erosion, stream sedimentation, loss of fish and wildlife habitat, and loss of forage and agricultural crop land. Adverse environmental impacts can also result from the improper use of Tordon. If Tordon label instructions are specifically followed, and only licensed applicators use the chemical, the adverse environmental impact from this project should be minimized. Consequently, the longer-term environmental impacts could be positive, by controlling the spread of the leafy spurge infestation. These positive effects, however, would last only as long as control methods are continued or until the leafy spurge infestations are eliminated.

PUBLIC BENEFITS ASSESSMENT

The proposal would protect the state's renewable resources through control of noxious weeds.

Benefits to the public from this project include land conservation by protecting it from leafy spurge infestation, which would make land availabe for use. Wildlife habitat would be enhanced by improving forage and native vegetation populations. Damage to public and private land from weed infestations would be prevented. Primary benefactors would be residents in the Dugout Creek area. All Montanans would benefit from reductions in leafy spurge infestations.

RECOMMENDATION

No funding is recommended for this proposal; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding programs.

APPLICANT NAME: McCone Conservation District

PROJECT/ACTIVITY: Conservation Tillage Demonstration

GRANT AMOUNT REQUESTED: $ 45,740

TOTAL PROJECT COST: $173,390

PROJECT DESCRIPTION

McCone County is one of five counties under the Soil Conservation Service's (SCS) proposed Dry Cropland Erosion Control Targeted Areas. McCone County was selected because its historic erosion from wind exceeds 50,000 acres of affected area; in 1984 that acreage was up to 150,000 acres. If federal approval is gained, funds would be allocated to the counties for erosion control practices.

Gary Tibke, State Agronomist for SCS, states that great improvements have been made in the past five years in tillage equipment, tillage practices, and grain variety adaption. In order to educate the farming public, demonstration areas properly established and monitored would give the farmers an opportunity to see results produced under everyday conditions by their farming associates.

This project would entail the establishment of four demonstration plots of 160 acres each located in different soil type areas over the county. Each plot would demonstrate the following practices:

1. No-till seeding using chem-fallow/alternate cropping
2. No-till seeding using chem-fallow/flex cropping
3. Reduced tillage/flex cropping
4. Reduced tillage/alternate cropping
5. Conventional tillage/alternate cropping

On each of these practices, the following reports would be made:

1. Soil loss attributed to wind (tons/ac.)
2. Soil loss attributed to water (tons/ac.)
3. All agricultural inputs (fuel, seed, fertilizer, etc.)
4. All production records by two methods (combine and plot sampling)
5. Yearly operator interviews to evaluate problems and attributes of each practice.

This project would have a minimum life of five years.

TECHNICAL FEASIBILITY ASSESSMENT

Soil erosion by both wind and water is a major national problem that has been studied for a number of years. This research would bring out the need for continued and updated education of farmers to better control their soil losses. Demonstration by a farmer to a farmer is considered the best method of education. This project would accomplish that goal. Technically, all the practices are sound under given conditions; supervision of the project through its useful life would be carried out by the Soil Conservation Service.

FINANCIAL ANALYSIS

Total Project Cost		$173,390
Funding Sources	Amount	
1. Legacy	$45,740	
2. "223" Funds, Conservation District Division, DNRC	8,270	
3. SCS Administration Funds	2,280	
4. McCone Conservation District	3,300	
5. Technical Non-cash services (SCS and Extension Service)	53,000	
6. Cooperators' non-cash contributions	60,800	
Total Funding Contributions		$173,390

No short-term financial benefits would be gained from the demonstration project. A budget analysis reveals no excess costs; rates used are from SCS and ASCS average-cost studies. All funds or in-kind services have been committed except for this application and the "223" funds from the Conservation Districts Division. Providing legacy grant funds are available, the loss of "223" funds would not keep the project from being carried out.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no negative effects on the environment with this project. Benefits would eventually be gained through the decrease in soil loss and increase in water quality.

PUBLIC BENEFITS ASSESSMENT

The McCone Conservation District serves 394 farms having a total of 490,000 acres of cropland in a county with a population of 2,775 people. The benefits of soil erosion control do not stop in that area, but would directly benefit the neighboring counties, which have about 2,000 farmers, and indirectly benefit the state and nation.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Missoula County Conservation District

PROJECT/ACTIVITY: Biological Control of Noxious Weeds Using Fungus

GRANT AMOUNT REQUESTED: $ 91,876

TOTAL PROJECT COST: $377,265

PROJECT DESCRIPTION

Virtually every county has a weed control program aimed at suppressing the spread of a number of noxious weeds. In Missoula County alone, noxious weed infestations are estimated to reduce forage production by $500,000 per year. In addition, herbicide use is not always popular in a state where the environmental ethic is a common concern. On one hand, noxious weeds destroy the ecological diversity of our public and private grazing lands; on the other hand, there is the potential danger with recurrent herbicide usage and its immediate economic cost. The current approach to weed control in Montana involves increasing the public awareness of weeds and weed control procedures, and intensified field and laboratory research on herbicides and biological controls. Coming out of this increased research in biological control was the discovery of a fungus (Sclerotinia sclerotiorum) that kills two of Montana's important weeds: Canada thistle and spotted knapweed. It also kills yellow starthistle, an invader species approaching Montana's western counties. The Missoula County Conservation District, in cooperation with the Bitterroot Conservation District, the Missoula County Weed Board, Montana State University, the University of Montana, and the Missoula County Extension Service, proposes to develop this biological control to the point where it can be produced and used in Montana.

The applicant plans to: 1) research a natural fungal agent found in Montana that kills Canada thistle, spotted knapweed, and yellow starthistle; 2) field test the fungus in a variety of habitats, rainfall conditions, and disturbed sites; 3) develop more effective methods of applying the fungus; and 4) transfer the technology of this biological control to a Montana-based business.

TECHNICAL FEASIBILITY ASSESSMENT

Research for the past five years culminated in successful field demonstration plots in Missoula County in the summer of 1984. Reduction in weed density was as high as 95 percent in the case of Canada thistle, where grass came back in the second year. Spotted knapweed was reduced up to 60 percent the first year.

EPA permission to use sclerotinia sclerotiorum was granted, but limited to ten acres for the entire state.

The proposed work has four phases:

1) Laboratory work with the disease (MSU, Bozeman) Sclerotinia sclerotiorum also kills safflower, sunflower, beans, and certain other crop plants. For EPA approval for widespread use, strains of the fungus that only kill weeds, not crop plants, need to be found or created. A program of breeding the fungus (fungal genetics) analogous to plant breeding would be necessary to obtain this new, restricted host range pathogen. There are at least five genetic approaches to this problem.

2) Development of better application methods (Bozeman and Missoula). The following methods would be developed in the laboratory and field tested in western Montana.
   A) Spray fungus like a chemical in conventional or slightly modified spray equipment.
   B) Use an insect to spread the pathogen.
   C) Induce natural spread of the disease from localized spot application.

3) Field plot studies to test modified methods of application and new selected strains of the fungus (Missoula and other county weed districts).

4) Technology transfer to a Montana-based business.

The work would be monitored twice annually by a subcommittee of the county weed boards and conservation districts.

Work would be centered in Missoula and Ravalli counties. However, conservation districts, weed boards, and county agents in other counties would have an excellent opportunity to participate.

It is anticipated that the project would be completed in two years.

The project has received a large amount of support from a variety of private and public entities and individuals.

The alternatives proposed appear feasible. Obvious emphasis would have to be placed on continuing laboratory and field research on the agent before proceeding to the distribution and promotion phases of the project.

Personnel from both Montana State University and University of Montana are involved in the research aspect of this project. Conservation District personnel would administer the funds and provide field work coordination.

FINANCIAL ANALYSIS

Total Project Costs		$377,265
Funding Sources	Amount	
1. Legacy	$ 91,876	
2. MSU	255,000	($15,000 in-kind services)
3. Extension	3,800	(In-kind services)
4. SCS and Conservation District	5,589	(in-kind services)
5. USDA	15,000	
6. Army Corps of Engineers	5,000	
7. Missoula County Weed Board	1,000	
Total Funding Contributions		$377,265

Of the $91,876 legacy contribution, $36,000 would provide personnel services for a fungal geneticist at Montana State University. Costs for a conservation district field coordinator would be $20,000. Vegetation analysis and vector studies would cost $12,200, and supplies, labor, and plot surveys would cost $9,000. University overhead charges of 20 percent would be included in these costs. Contingency would be provided at $2,676.

Cost estimates appear reasonable and adequate.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project providing care is taken not to allow the fungus to infect beneficial plants.

Positive impacts may result if the project results in a biological agent that reduces knapweed and Canada thistle, and reduces the need for chemical herbicides.

PUBLIC BENEFITS ASSESSMENT

The project would protect Montana's natural resources through weed control. All Montanans would benefit if a safe, easy to use, economical method of weed control was available.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Montana Board of Oil and Gas Conservation

PROJECT/ACTIVITY: Reclamation of Abandoned Oil and Gas Exploration and Production Facilities

GRANT AMOUNT REQUESTED: $1,160,000

TOTAL PROJECT COST: $1,160,000

PROJECT DESCRIPTION

The Board of Oil and Gas Conservation (board) is responsible for establishing rules for oil- and gas-well plugging, pollution prevention, and reclamation. The board monitors compliance with these rules and works to direct the responsible parties to correct any problems associated with abandoned wells. According to statute, when the responsible party cannot be located, DNRC may reclaim the disturbed lands with funds from the Resource Indemnity Trust (RIT) Fund, when available. In view of this authority, the board has requested a $1,160,000 grant to provide contingency funds to plug and abandon oil and gas exploration and production well sites.

The board plans to use existing administrative and professional staff to review potential projects when problems arise. The staff would also monitor any projects approved for reclamation by the board.

TECHNICAL FEASIBILITY ASSESSMENT

The board requested a contingency fund to establish a permanent trust fund to provide funds for both ongoing and emergency reclamation of oil and gas production sites. It appears that the fund is intended to cover three well site problem categories: 1) wells drilled before 1954 regulation that might have been improperly plugged and abandoned and that have no bond or responsible operator, 2) post-1954 wells that have no responsible party or were inadequately bonded, were not properly plugged and abandoned, and did not complete surface reclamation, and 3) emergency situations such as poisonous hydrogen sulfide leaks or blowouts that are beyond the capability of the operator to control.

There is little information available to predict the number of projects that would require funding under this proposal. Three sites have been reclaimed by the board in the past. There has been one instance in which the board could have used emergency funds to correct a problem with a well contaminating area soils. The board expects the limited number of problem situations to increase because of old well fields nearing depletion, a closer examination of many old well sites and inadequate bonding of some new deep Overthrust wells.

Although the board has funded very few oil and gas well reclamation projects in the past, the need for a future reclamation effort and emergency funding is indicated. The board is directed by law to address necessary well site reclamation using available RIT funds. A responsible party cannot always be located, since many old wells were drilled by companies that no longer exist. Newer wells may also require reclamation assistance if a company is financially unable to continue business and reclamation costs exceed the standard well bond coverage of $5,000. This situation could also include a threat to the public or public property that would warrant use of emergency

funds by the board. However, the amount of money needed for such an emergency fund is not documented in the application. Also, there are no administrative plans, goals, or eligibility criteria for use of funds identified in the application.

FINANCIAL ANALYSIS

Total Project Costs		$1,160,000
Funding Sources	Amount	
1. Legacy	$1,160,000	
2. Applicant	-0-	
Total Funding Contributions		$1,160,000

The grant proposal contemplates establishment of a revolving contingency fund with proceeds to be used by the board for on-going well site reclamation. The fund itself could be used by the board for well site emergencies. The applicant has indicated that such emergency funds used by the board might be recouped at a later time, possibly after legal action.

ENVIRONMENTAL IMPACT ASSESSMENT

The applicant intends to use the requested funds for well site reclamation. These activities would protect the environment in the areas of ground water, surface water, soils, etc. The degree of such positive impacts would depend on the reclamation practices used by the board.

PUBLIC BENEFITS ASSESSMENT

Oil and gas well site reclamation is generally the responsibility of the oil company in control of the projects. The public would benefit from board-sponsored reclamation in those instances where public resources are threatened and no responsible party will perform the work. Public benefits could include public safety, protection of natural resource environment, and resource conservation.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Consolidation of Water Data From Montana's Coal Region

GRANT AMOUNT REQUESTED: $66,680

TOTAL PROJECT COST: $81,060

PROJECT DESCRIPTION

In the coal region of southeastern Montana, millions of dollars have been spent by industry and state and federal agencies to collect data on the region's ground water. Most of the data, having met momentary regulatory or research needs, is no longer used and occupies files and bookshelves at the Montana Department of State Lands (DSL). These data would be of value if the data could be consolidated into a master file under a single format. Some of the data is of poor quality but most is thought to be of good quality and quite useful. Now, immediately following the intense studies of the 1970s, is the best time for making the value judgments necessary to sort, compile, and preserve the dependable information for posterity.

This project proposes to assimilate the best information from the past decade into one master file, usable for whatever needs the future might bring. Data to be condensed under one format include water levels, geologic data, and water quality analyses for more than 1,500 wells that have been installed by eight mining companies. The original data plus subsequent monitoring data comprise as many as 10,000 water analyses and water levels. It is proposed to have professional hydrogeologists scan and evaluate data at the offices of DSL and list all logs, analyses, and water levels judged to be dependable with the computer system managed by the Montana Bureau of Mines and Geology (MBMG). The data would become part of the Ground Water Information Center (GWIC).

TECHNICAL FEASIBILITY ASSESSMENT

The project as proposed is merely data evaluation and logging and is technically feasible. Professional hydrogeologists would be required for the review and evaluation of all data. Technicians would enter approved data into the computer storage system.

FINANCIAL ANALYSIS

Total Project Cost		$81,060
Funding Sources	Amount	
1. Legacy	$66,680	
2. Applicant	$14,380	
Total Funding Contributions		$81,060

The project budget breaks down as follows: contract administration - $18,940 (includes $11,650 of indirect costs), professional and technical costs - $50,940 (includes $4,760 in travel costs), and $11,180 for contingencies. The applicant would contribute $14,380 to the project. The project would be completed within the biennium.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would not have any adverse or other impacts on the environment.

PUBLIC BENEFITS ASSESSMENT

The proposed project would provide evaluation and storage of ground water data that may aid future regulatory agency decision makers in assuring wise use of Montana's natural resources. The improved data base would be the compensation for the project cost. The primary benefactors of this project would be the state and federal regulatory agencies.

RECOMMENDATION

No funding is recommended for this application. Instead, the MBMG application to set up the GWIC would be increased by $50,000 to accommodate evaluating and logging of this data.

APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Evaluation of Seismicity in the Cut Bank Region

GRANT AMOUNT REQUESTED: $165,939

TOTAL PROJECT COST: $165,939

PROJECT DESCRIPTION

The production of oil and gas has induced earthquakes to occur in several oil fields in the western United States. Over the past five years, several earthquakes have been located near Cut Bank, Montana, in the Kevin-Sunburst oil field.

The Montana Bureau of Mines and Geology proposes to install and operate a seismograph network in the Kevin-Sunburst oil field to be operated over a two-year period. The data gathered by this network is expected to identify active faults, determine fault movements, and suggest or identify the source of the seismicity.

The applicant has indicated that information obtained from the proposed seismic study will be valuable, since oil and gas exploration has increased in the Overthrust Belt in recent years. Any production from Overthrust wells will probably be in mountainous areas of natural earthquake activity.

TECHNICAL FEASIBILITY ASSESSMENT

The proposed seismic study is expected to achieve the following objectives: 1) determine whether the earthquakes occur at shallow depths related to oil and gas production or are occurring deep below the surface, resulting from natural earthquakes, 2) identify the location and forces of active area faults, and 3) identify the hazards associated with the active faults. The project would be accomplished in two phases. First, eight seismograph stations would be installed and connected to a data telemetering station. A computerized data acquisition system would be installed in Butte to record and process telemetered data. Second, data would be collected and the earthquake activities assessed relative to the area's oil and gas production. The products of the proposed program would include detailed maps of earthquake locations and active faults, graphs of seismicity and oil field activity, maps delineating seismic hazards, and a narrative report.

Three earthquakes of a 3.0 to 5.0 magnitude have been recorded in the oil field area since 1979. Other earthquakes may have occurred before installation of accurate seismographs in western Montana in the mid-1960s. Such small- to moderate-sized earthquakes have the potential for causing damage, especially if they occur at very shallow depths. Shallow earthquakes have been attributed to fluid extraction and injection in Colorado and California.

The proposed plan appears feasible, although the data collection period is very short. Also, the final products may not have wide application beyond those scientists working in the seismic discipline.

FINANCIAL ANALYSIS

Total Project Costs		$165,939
Funding Sources	Amount	
1. Legacy	$165,939	
2. Applicant	-0-	
Total Funding Contributions		$165,939

The proposed project budget includes $55,736 for personnel services, $68,632 for equipment, $24,850 for operations, and $16,721 for indirect costs.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no expected long- or short-term environmental impacts.

PUBLIC BENEFITS ASSESSMENT

The project would provide research information on seismic activity relative to specific oil and gas production. Benefits would accrue directly to the seismic scientific community. Indirect benefits could accrue to the Cut Bank area through earthquake hazard information.

RECOMMENDATION

No funding is recommended for this proposed seismicity study. The hazards attributed to oil and gas production related earthquakes have not affected the sparsely populated Kevin-Sunburst oil field. The results of the proposed study do not appear needed at this time.

APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY: Monitoring for Arsenic in the Madison River Alluvial Ground Water

GRANT AMOUNT REQUESTED: $30,892

TOTAL PROJECT COST: $47,656

PROJECT DESCRIPTION

Ground water in the Madison River Valley is known to contain elevated levels of arsenic. The concentration of arsenic appears to vary within the alluvial formation; some areas produce water with excessive levels (in excess of the Environmental Protection Agency (EPA) Drinking Water Standards), and other areas produce water with elevated but acceptable arsenic levels.

This project proposes to study existing ground water data and gather additional data from the Madison River alluvium from the Yellowstone National Park boundary to the source of the Missouri River and identify areas where arsenic levels are known to be excessive. The results would be published in a report and made available to appropriate local, state, and federal agencies. The project would also include test drilling and leach studies to try to determine the source of the high arsenic levels.

TECHNICAL FEASIBILITY ASSESSMENT

The selected methods of determining the extent and source of the high arsenic levels in the Madison River alluvium appear to be technically feasible. Preliminary work of a similar nature by the applicant has been used by the Town of Three Forks to locate a new municipal water supply that has lower levels of arsenic.

FINANCIAL ANALYSIS

Total Project Cost		$47,656
Funding Sources	Amount	
1. Legacy	$30,892	
2. Applicant	$16,764	
Total Funding Contributions		$47,656

The applicant would provide approximately 35 percent of project funding. The project budget for the legacy portion of project costs shows $2,354 for contract administration, $29,277 for professional and technical costs (of which $2,435 would be for travel, $3,509 would be for analysis and $9,000 would be for drilling) and $4,261 would be for contingencies. The applicant's portion of the costs would be used for salaries, benefits, overhead, and per diem for the principal investigator, who is already on the applicant's professional staff. The applicant provided for contingencies in the amount of $2,312.

The applicant applied to the DNRC Water Development Program for funding of a somewhat expanded version of this project. DNRC recommended a grant of $44,000 for the project but funding is questionable because of limited grant funds. The legislature would make the final decision regarding funding of the water development grant.

ENVIRONMENTAL IMPACT ASSESSMENT

No long-term adverse environmental impacts would result from this project. Any adverse effects from well drilling and testing would be short-term and minor.

PUBLIC BENEFITS ASSESSMENT

The project would provide for research and demonstration to promote the wise use of Montana's natural resources, in this case, the alluvial ground water resources of the Madison River Valley. The present and future residents of the Madison River Valley from the Yellowstone National Park boundary downstream to Three Forks could benefit from this project. The improved knowledge of the arsenic contamination of the area ground waters would be beneficial.

RECOMMENDATION

Although the proposed project would provide interesting information, such information would be of most use in this particular area to private land developers. Under current state subdivision regulations such developers are required to gather site-specific data on ground water quality and quantity--at their own expense--prior to subdivision approval. The legacy program should not fund data gathering that would otherwise be the responsibility of private developers. Therefore, no funding is recommended for this project.

APPLICANT NAME: Montana College of Mineral Science and Technology

PROJECT/ACTIVITY: Assess the Use of a Natural and Waste Resource for Production of Trace Mineral-free Vegetables

GRANT AMOUNT REQUESTED: $353,070

TOTAL PROJECT COST: $353,070

PROJECT DESCRIPTION

Montana has to import most of its fresh vegetables. The object of this proposal is to test the feasibility of using hot springs water and sewage effluent for growing fresh vegetables in-state using greenhouses and hydroponic (no soil) solutions for plant growth. The hot springs water would heat the greenhouses as well as provide nutrients for the plants. The sewage waste effluent would also provide nutrients.

TECHNICAL FEASIBILITY ASSESSMENT

The project sponsor would build a greenhouse on the Warm Springs Hospital property and use the hospital hot springs. Sewage effluent would be brought in from Butte-Silver Bow. Tomatoes and lettuce would be grown and the vegetables would be monitored for uptake of elements that would make them unfit for human consumption. The hydroponic solution would be monitored to determine the appropriate mix of hot spring water and sewage effluent that would provide necessary nutrients. Additional nutrients would be added as needed.

The stated goal of this project is to provide information that could serve to develop a new commercial industry in Montana. However, no economist is involved in the project and no attempt has been made to prove economic feasibility of any of the aspects of the project; while the approach may be technically feasible, it may never be implemented due to economic infeasibility. It appears unlikely that the project as proposed could translate into a profitable industry for the private sector.

FINANCIAL ANALYSIS

Total Project Cost		$353,070
Funding Sources	Amount	
1. Legacy	$353,070	
Total Funding Contributions		$353,070

The budget calls for a full-time professor, five professors part-time, one graduate student, and one undergraduate student. This staffing appears somewhat beyond that necessary for a project of this scope.

ENVIRONMENTAL IMPACT ASSESSMENT

The impacts should be minimal.

PUBLIC BENEFITS ASSESSMENT

This project fits in the legacy category "provide for research, demonstration, and technical assistance to promote the wise use of Montana's natural resources."

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana College of Mineral Science and Technology, Department of Environmental Engineering

PROJECT/ACTIVITY: Historic Arsenic Emissions in the Clark Fork

GRANT AMOUNT REQUESTED: $72,631

TOTAL PROJECT COST: $73,715

PROJECT DESCRIPTION

The historic smelting of Butte ore has caused an arsenic environmental contamination problem in the Clark Fork River drainage. It is possible that the smelting process can be traced as a source of arsenic all the way to the Pacific Ocean. To impose effective control of this problem the total extent of the pollutant must be assessed, particularly in the Clark Fork river system where the watershed may continue to release the pollutant and make downstream cleanup ineffective.

The Montana College of Mineral Science and Technology proposes to assess the extent and mobility of arsenic in the Clark Fork watershed above the Milltown dam. The quantity, concentration, and distribution of arsenic would be measured through modeling, soils analysis, and mass balance evaluation of soil, sediments, flue dust, surface and ground water, and escaped air shed.

TECHNICAL FEASIBILITY ASSESSMENT

The project design calls for the review of 100 years of smelting data and partitioning the results by location, air, water, and land disposal. Air diffusion modeling would determine the amount of arsenic that left the watershed by air transport. Soil sampling analysis would consist of evaluation of samples already collected, and collection of others to fill in the gaps. A mass-balance analysis would determine the proportions of arsenic in various parts of the study area, and estimate the amount transported downstream. Final data would be used to develop effective control and clean-up plans. The project would take two years to complete.

There appears to be duplication of effort between the project and other studies being conducted on the Clark Fork River. Reviewers feel the data from the study would be too general to be useful, and that remedial cleanup measures would be impractical. Instream arsenic concentrations rarely exceed the EPA chronic toxicity threshold. A more thorough literature search is needed.

FINANCIAL ANALYSIS

Total Project Cost		$73,715
Funding Sources	Amount	
1. Legacy	$72,631	
2. Applicant	1,084	
Total Funding Contributions		$73,715

Salaries and benefits for the project engineer and field and laboratory assistants would total $36,148. Computer costs and field and laboratory supply costs would be $9,223, and analytical costs would total $29,223. Contingency and inflation would add $10,844 to the project cost. Cost estimates appear reasonable and adequate; however, they would duplicate other efforts funded through the EPA/DHES Superfund Program.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this study. The understanding of arsenic contamination in the Clark Fork basin could be a positive result.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide for research to assess past or potential environmental damage resulting from natural resource development. Primary benefactors would be researchers working on Clark Fork River basin studies. All Montanans could benefit if study results prompt action toward reduction of arsenic contamination in the Clark Fork River basin.

RECOMMENDATION

Because the project would duplicate ongoing or planned studies in the Clark Fork basin, no funding is recommended for this proposal.

APPLICANT NAME: Montana College of Mineral Science and Technology

PROJECT/ACTIVITY: Ecological, Geochemical, and Geotechnical Aspects of Hard-rock Mined Land Reclamation

GRANT AMOUNT REQUESTED: $735,324

TOTAL PROJECT COST: $735,324

PROJECT DESCRIPTION

The Montana College of Mineral Science and Technology is proposing a research project to address several problems associated with reclamation and material stability of hard-rock mining areas. Problems to be addressed include physical stability of mine overburden and reclamation sites, air and water pollution, establishment of vegetative cover, and buildup of toxic elements in the food chain. The project would be conducted over a two-year period and would result in technical reports, presentations, and published papers available to people involved in hard-rock mining and reclamation.

The need for this project is based on the argument that satisfactory reclamation of abandoned hard-rock mining wastes requires interdisciplinary planning. The applicant has stated that very little research and baseline data relates to cost-effective practices. Also, the applicant asserts that a variety of unanswered questions arising from recently approved reclamation plans need to be answered in this study.

TECHNICAL FEASIBILITY ASSESSMENT

The overall study plan is divided into eight individual work programs. These programs include: 1) development of economical reclamation approaches for small mining operations; 2) reducing revegetation costs of acid-producing wastes; 3) greenhouse and field trials of reclamation plants; 4) vegetation of abandoned mine sites; 5) biological control of acid mine drainage; 6) development of a plant toxicity test for selecting reclamation sites; 7) assessment of accumulation of heavy metals in food chains; and 8) development of engineering and geotechnical standards. Each work program incorporates a separate methodology and each appears to result in a separate product.

An assessment of the need for this research information is difficult because of the diverse nature of the proposal and limited information in the proposal addressing need. The need is generally supported by the large number of abandoned mines in the state and the seriousness of related acid-mine drainage problems. The overall need is further supported by high reclamation costs and limited cost data. However, the need of each specific study element is uncertain. Coordination of hard-rock mine reclamation research efforts with appropriate state and federal agencies is necessary to establish research needs and priorities. This coordination is particularly important in the proposed project, where a wide variety of questions are to be addressed in a relatively short period of time. A phased research approach using the priorities of government and industry would help assure that critical areas are adequately addressed. Unnecessary effort and duplication could also be avoided under this approach.

The study product or use of the product is also somewhat uncertain. Several of the work elements have individual reports or manuals listed as final products while others are not specific. The application stated that the project would result in technical reports, presentations, and published papers available to the mining and reclamation communities. Since this effort is based on a multidisciplinary planning approach, the study results should be available in a single, integrated document.

FINANCIAL ANALYSIS

Total Project Costs		$735,324
Funding Sources	Amount	
1. Legacy	$735,324	
2. Applicant	-0-	
Total Funding Contributions		$735,324

The proposed two-year study budget includes $386,595 for personnel services, $232,750 for operating costs, and $115,979 for indirect costs (30 percent of personnel).

The application does not address other possible funding sources including the Abandoned Mine Reclamation Program and possible use of federal reclamation money awarded to the college.

ENVIRONMENTAL IMPACT ASSESSMENT

The long-term environmental impacts should result in improved reclamation practices. The short-term impacts are uncertain since mine sites and practices have not been selected. The work would probably decrease water quality near the sites for a short period.

PUBLIC BENEFITS ASSESSMENT

Research results would directly benefit reclamation agencies and mining companies. Primary benefits include provision of methods to revegetate mined areas, preserve water quality, and reclaim unsafe mined areas. Montanans would indirectly benefit after mines are reclaimed--especially since many of the areas are on public land.

RECOMMENDATION

No funding is recommended for this proposed research effort. The eight-part project is very ambitious and would be difficult to adequately address in the two-year period afforded by the legacy program. Hard-rock reclamation research should be coordinated with appropriate state and federal agencies to establish research needs and priorities. Also, the proposed projects appear fragmented and may not result in useful products.

APPLICANT NAME: Montana College of Mineral Science and Technology

PROJECT/ACTIVITY: The Effect of Exposure to Radon Progeny Radiation on Mortality Rates in Butte Homes

GRANT AMOUNT REQUESTED: $12,372

TOTAL PROJECT COST: $12,372

PROJECT DESCRIPTION

A comparison of data from a 1983 Environmental Protection Agency (EPA) study indicates that 38 percent of Butte homes are above the EPA caution level and three percent are above the action level for recommended indoor radon concentrations. The effect of low-level, long-term exposure to radon progeny is not well known; therefore, the Montana College of Mineral Science and Technology proposes to investigate any relationship between radon levels in Butte homes and death rates in these homes. Death rates over the past fifty years would be extracted from the Butte-Silver Bow Coroner's Office and correlated with radon levels already measured in Butte homes.

TECHNICAL FEASIBILITY ASSESSMENT

Two students would analyze individual death records in Butte for the past fifty years. For each acceptable death record, the age and cause of death would be recorded along with the address of birth. All data would be entered into a computer and classified by a medical consultant as to whether the death could be the result of prolonged exposure to radon progeny. Results would be made available to Butte residents. The study would take three months to complete.

Occupational health and statistics professionals who reviewed the proposal feel that the results gained from this study would be duplicating information already available from the EPA and the National Council on Radiation Protection. The addresses of the homes in Butte where radon concentrations were previously measured are confidential, and would not be available to the grant applicant. Nor are death rates available from the Coroner's office. The Montana Board of Health and Environmental Sciences has to grant permission for access to death certificates, and these certificates may not provide accurate assessments of causes of death. Birth records may need to be evaluated as well, and the proposed budget does not appear to reflect this added expense. Because there is no control population to compare with the study population, results may not be scientifically valid.

FINANCIAL ANALYSIS

Total Project Cost		$12,372
Funding Sources	Amount	
Legacy	$12,372	
Total Funding Contributions		$12,372

Of the $12,372 proposed budget, $8,110 would be for personnel services and benefits for data collectors, a radiation scientist, and a statistician. Operation costs would include $1,000 for a medical consultant and $1,200 for computer time, supplies, phone, and travel. Indirect costs would be an additional $2,062.

Cost estimates may be insufficient to complete the proposal since research information is not available from the Butte Coroner's Office.

ENVIRONMENTAL IMPACT ASSESSMENT

This proposal would have no adverse environmental effects. Positive effects may occur, in the form of information assessing health risks from radon in Butte homes. However, this information may duplicate work that has previously been done.

PUBLIC BENEFITS ASSESSMENT

This proposal may provide research to assess past or potential environmental damage resulting from natural resource development. Residents of Butte would be the primary beneficiaries.

RECOMMENDATION

Because this proposal duplicates work previously done by other agencies, no funding is recommended.

APPLICANT NAME: Montana College of Mineral Science and Technology

PROJECT/ACTIVITY: Mining Subsidence Study

GRANT AMOUNT REQUESTED: $16,135

TOTAL PROJECT COST: $16,135

PROJECT DESCRIPTION

The study objective is to investigate subsidence problems caused by mining across the country and in Europe and discuss methods that have been or could be used to address problems in the West.

Subsidence is a severe problem in some areas of Montana. The Montana Abandoned Mine Reclamation Bureau has located 47 individual subsidence sites in Montana. Many of these sites have made farming land unusable and are creating hazards to buildings, highways, and other structures.

State-of-the-art information regarding reclamation of subsidence sites is not widely available in published form. This proposal is intended to collect information on mine subsidence methods in Europe, the eastern United States and the West. The results of this research would be compiled in a report with recommendation for application in the western United States.

TECHNICAL FEASIBILITY ASSESSMENT

Project methodology would include identifying potential sources of information, contacting sources, and documenting the information. A report would be compiled describing different methods of subsidence area reclamation and recommendation for use of these methods in the West.

The project would be scheduled to begin in September 1985. The report would be completed in August 1986.

FINANCIAL ANALYSIS

Total Project Cost		$16,135
Funding Sources	Amount	
1. Legacy	$16,135	
Total Funding Contributions		$16,135

In the proposed project budget, $11,326 would be used for salaries and benefits (80 percent of these funds would support graduate student time). The remaining budgeted funds, $4,809, would be used for travel ($1,000), supplies ($1,120), and indirect costs ($2,689).

ENVIRONMENTAL IMPACT ASSESSMENT

No environmental impacts would occur as a result of this project. Information generated through this project could help to mitigate impacts of reclamation work done in subsidence areas in Montana.

PUBLIC BENEFITS ASSESSMENT

This project may be valuable in compiling information on mine subsidence that is not now currently available. Government agencies and private industry might use this information in reviewing mine design, so potential subsidence can be minimized, and in selecting reclamation methods to mitigate problems associated with existing subsidence areas.

RECOMMENDATION

No funding is recommended for this project because the need for this work is not well documented.

APPLICANT NAME: Montana College of Mineral Science and Technology, Department of Environmental Engineering

PROJECT/ACTIVITY: Quantification, Characterization, and Control of Fugitive Dust Emissions from Tailings and Waste Dumps

GRANT AMOUNT REQUESTED: $242,593

TOTAL PROJECT COST: $242,593

PROJECT DESCRIPTION

Montana historically has had an abundance of mineral resources. The recovery of those resources has deposited tailings in many locations throughout the state. The effects of those tailings on water quality has long been a subject of study, but the effects of the tailings on ambient air quality has not.

Tailings, because of the grinding process, contain many small particles that are easily picked up and transported by the wind. The effect of wind-borne tailings can be seen locally in the form of dust and dirt that coat the area, and the damage to property by "sand blasting." The effects can also be seen much further downwind in the form of a very fine dust coating that results from the transport of fine particles. These dust coatings are washed into watersheds and drinking water supplies by precipitation. The fine dust particles in the air can also cause respiratory problems.

The tailings and dumps are continuously subjected to differing weathering conditions. No studies have been done on the size range of particulates that could be transported from these tailings and dumps and remain suspended in air. The chemical characteristics and size range of the particles have a direct relationship to human health, and also inhibit visibility. Coarse and fine particulates contribute in different degrees to property damage. Lack of information in these areas makes it impossible to evaluate the impact of their source on the health, property damage, and well-being of the community.

The College of Mineral Science and Technology proposes to quantify particulate emissions and characterize the materials of tailings and dumps, and evaluate control methods for cost effectiveness. Methods include mass flux and profiling techniques, determining diffusion coefficients, soil sampling and sizing, and evaluation of physical, chemical, vegetative, and combination control methods.

TECHNICAL FEASIBILITY ASSESSMENT

Because the tailings are deposited over an area, their contributions to air pollution are much more difficult to measure than the contributions of point sources. The traditional method of estimating airborne particles from fugitive sources has been to use ground-based, high-volume samplers. Dispersion modeling is normally used to estimate the source strength from the high-volume data. Considerable error can be introduced in emission estimates because of the often limited number and location of sampling sites and due to the simplicity of the atmospheric dispersion models. Complications increase when the source is not well defined. For this reason, this research would use more reliable techniques to estimate emission rates. A total mass flux and

profiling technique would be the preferred method to measure emission rates under field conditions. This would be coupled with sampling grids, video photographs, particle counting, and modeling.

Factors, such as moisture and temperature, affecting the surface of the tailings would also affect the particulate emissions from the tailings. These factors would result in a seasonal cycle in the emissions from the tailings. Measurement of these factors would permit their use in calculations predicting emissions from similar tailings deposits. Characterizing the particulates on the soil surface, and those transported and suspended in the atmosphere, would be accomplished by chemical element balance. This would provide valuable information about the percentage of contribution of such sources to the total particulates. These particles would be analyzed to determine the chemical constituents of the air-blown dusts.

Methods of stabilizing the tailings' surface are being studied. Measurement of the reduction of the tailings emissions resulting from the various stabilization methods with an economic evaluation would determine the cost effectiveness of the various methods.

The results of this proposed research study would be used by regulatory authorities such as the State Air Quality Bureau (AQB), the Department of State Lands (DSL), the State Solid Waste Bureau, county health departments and the Environmental Protection Agency to assess the impact of tailings and dumps on local air quality and to develop cost-effective control strategies. This data would become useful guidelines for new development and construction, minimizing the problem in the planning stage and saving tax dollars. The project could be completed within two years.

The specific site for conducting the proposal has not yet been identified, nor have the detailed work plans been drawn up. Reviewers indicated most of their questions could be answered in a detailed final design and plan. While it is recognized that this study could provide needed information for regulatory agencies, particularly on effective control measures, the proposal has not been coordinated with Superfund proposals to insure that there is no duplication of efforts.

FINANCIAL ANALYSIS

Total Project Cost		$242,593
Funding Sources	Amount	
1. Legacy	$242,593	
2. Applicant	-0-	
Total Funding Contributions		$242,593

Personnel costs and benefits would total $130,777. Equipment, chemical analysis, supplies, computer time, travel, and publication costs would be $43,500. Indirect costs would add an additional $34,855, and inflation and contingency would amount to $33,461.

It is not possible to assess the adequacy of the budget without having a more detailed project plan. No other funding sources have been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are anticipated from this project. If project results prompt the development of effective measuring and control methodologies, positive impacts to air quality and public health could be made.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide research to protect the state's renewable resources through restoration of tailings piles and dumps. It could provide research to make processing more environmentally compatible.

Primary benefactors would be residents living near tailings and dumps where potential control methodologies resulting from this study could be carried out.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana Department of Agriculture

PROJECT/ACTIVITY: Montana Coordinated Weed Management Project

GRANT AMOUNT REQUESTED: $200,000

TOTAL PROJECT COST: $423,798

PROJECT DESCRIPTION

Noxious weeds are recognized as a major problem in Montana; however, uncoordinated control programs over the years have not been cost-effective or effective in their long-term control. Coordinated management efforts can provide more effective control.

The Montana Department of Agriculture proposes to provide technical and cost-share financial assistance to local communities that have developed and are implementing coordinated weed management projects. Legacy grant funds would be subgranted by the Montana Department of Agriculture to 10 to 20 geographically separated communities for such projects as weed inventories and mapping, weed identification and education, cost sharing, and provision of supplies and materials for weed control. Local recipients would have to match these funds at a minimum amount of 50 percent. The Department of Agriculture would also provide direct technical assistance to the county weed districts, using both Department of Agriculture funds and grant funds.

TECHNICAL FEASIBILITY ASSESSMENT

The coordinated management approach to weed control is considered the best alternative to fragmented and piecemeal attempts to contain weed infestations. However, because specific weed infestation sites and the local recipients of the grant funds have not been identified, it is not possible to

assess the technical feasibility of the selected control alternatives. Criteria for developing the specific coordinated management plans eligible for funding are not defined by the Department of Agriculture in this proposal.

FINANCIAL ANALYSIS

Total Project Costs		$423,798
Funding Sources	Amount	
1. Legacy	$200,000	
2. Montana Department of Agriculture	34,798	
3. Local Match	189,000	
Total Funding Contributions		$423,798

The $34,798 MDA contribution would be for contract administration, monitoring, printing, travel, and evaluations.

Legacy funds would provide $6,000 for legal review, accounting and auditing, and $5,000 for MDA field expenses.

The remaining $189,000 of the Legacy funds will be matched by the local project cooperators at $189,000. This total $378,000 will be for mapping, taking inventory, organizing projects, and for chemicals and other control methods.

Because specific projects have not been identified to receive funding, the financial feasibility of the control alternatives cannot be assessed.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled noxious weed infestations can severely affect the agricultural and rangeland resource, and can result in wind and soil erosion and stream sedimentation. Proper weed control efforts can prevent the infestations from spreading and improve the environmental quality of the land resource. Improper chemical control methods can result in short- and long-term adverse environmental effects, while proper application techniques can minimize these effects.

PUBLIC BENEFITS ASSESSMENT

This project would protect Montana's renewable resources through weed control efforts. Specific benefactors cannot be identified without knowledge of the location of the control projects. However, all Montanans would benefit from reductions in various weed populations and infestations.

RECOMMENDATION

No funding is recommended for this project. The objectives of this proposal can be carried out through the Department of Agriculture's weed trust fund program.

APPLICANT NAME: Montana Department of Commerce

PROJECT/ACTIVITY: Resource Development Impact Mitigation Program

GRANT AMOUNT REQUESTED: $400,000

TOTAL PROJECT COST: $400,000

PROJECT DESCRIPTION

The Department of Commerce through its Community Development Division is proposing a comprehensive resource impact mitigation program to address community socio-economic impacts not currently assisted by the Montana Coal Board or Hard Rock Board programs. Commmunities proposed for assistance include those affected by oil and gas development, soft-rock mining activities, resource related construction activities, small hard-rock mine activities, and tail end "bust" impacts. The proposal anticipates providing assistance to affected communities through a grant program that would provide emergency staff, comprehensive impact teams, or community facility planning assistance. A state-wide impact and needs assessment activity is also planned.

TECHNICAL FEASIBILITY ASSESSMENT:

Contracted impact teams provided through the grant program would identify the special needs of the responsible industry, local governments, and private sector in the community. Individualized impact assistance programs would be developed, using a variety of assistance mechanisms listed in the proposal. The small grant program could also provide emergency specialized personnel in planning, management, and financing.

The state-wide impact assessment would identify legal and financial constraints to impact problems and possible solutions, and develop publications and audiovisuals on impact assistance techniques. The proposal anticipates that the activities in the first year of the program would include "scoping" of eligible communities, developing grant procedures and conducting the application process. The second year activities would include awarding and implementing the grants and conducting the state-wide needs assessment. The grant program would be developed from the Community Development Block Grant procedures and the application review team would include representatives from the Coal Board and Hard Rock Impact Board. The specific needs which the proposal would like to address are not discussed. Staff from affected communities reviewed the proposal and discussed the need for a long-term funding source for the program.

FINANCIAL ANALYSIS

Total Project Costs		$400,000
Funding Sources	Amount	
1. Legacy	$400,000	
Total Funding Contributions		$400,000

All project costs are proposed for funding from the legacy program. In-kind contributions from the Department of Commerce and grant review assistance from the Coal and Hard Rock boards are mentioned but not included in the budget. The annual budget includes $30,000 for administrative salaries, $25,000 for support services and $145,000 for project work. The annual project budget includes $85,000 for direct assistance and $60,000 for the state-wide assessment. Although there are currently no programs available to carry out the assistance approach discussed in the proposal, the administration is proposing the consolidation of the two existing impact assistance programs, the Coal Board and the Hard Rock Board.

ENVIRONMENTAL IMPACT ASSESSMENT

The proposal would have no direct impact on the environment. If mitigation measures developed through the community assistance grants were implemented, socio-economic impacts in affected communities could be reduced.

PUBLIC BENEFITS ASSESSMENT

If the anticipated impact mitigation plans were implemented, public benefits would result, especially through the provision of new or expanded community facilities and more equitable financing mechanisms for these facilities.

RECOMMENDATION:

No funding is recommended for this proposal.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Makoshika Road Paving

GRANT AMOUNT REQUESTED: $290,000

TOTAL PROJECT COST: $290,000

PROJECT DESCRIPTION

Makoshika State Park is located near Glendive. This scenic park, featuring badlands topography, receives about 60,000 visitors per year.

The main entrance road to the park has been partially paved under past projects. There remains about one and one-half miles of gravel road midway. This unpaved portion is very rough, creates a dust problem, has high maintenance costs, and is aggravating and unsafe for visitors.

This project would complete the paving of the entrance road.

TECHNICAL FEASIBILITY ASSESSMENT

Final design work for the project needs to be done before a technical feasibility assessment can be completed.

The Department of Fish, Wildlife and Parks has this project high on its priority list as the change from paved roads to a low quality gravel road has caused accidents as well as damage to automobiles.

FINANCIAL ANALYSIS

Total Project Cost		$139,743
Funding Sources	Amount	
1. Legacy	$115,968	
2. DFWP	23,775	
Total Funding Contributions		$139,743

The $23,775 contribution by the DFWP would provide fees for the range consultant at $1,275. Field headquarters, travel costs, and equipment cost would total $4,500. Aerial elk survey costs would be $13,000, and a non-game inventory would cost $5,000.

The legacy grant would provide $26,043 for salaries for the range consultant and field assistants. Fencing costs would be $49,200, and laboratory costs would be $10,600. Supplies and materials would cost $1,400, and travel costs would amount to $11,130. Report printing, telephone, and equipment maintenance costs would run $1,600, and inflation and contingency would add $15,995 to the project cost.

Fencing costs per mile would be $6,000. Weed control methods would occur only on a small area within the fenced pastures, but the fence would also provide better future grazing control for the Wildlife Management Area. All other costs appear reasonable and adequate.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled knapweed infestations have long- and short-term adverse environmental effects by replacing native vegetation used for livestock and wildlife forage and increasing the potential for soil erosion and stream sedimentation. Improper use of chemical control measures can also adversely affect wildlife and watersheds.

Adverse environmental effects from the proposed weed control project would be negligible, given proper use of herbicides and burning methods. If the study identifies a successful method that can be applied through the Wildlife Management Area, results would provide long-term positive environmental effects.

PUBLIC BENEFITS ASSESSMENT

If successful in determining the most effective, safe, knapweed control method, benefits to the public through protecting Montana's renewable resources would include improved grazing land and wildlife habitat land quality and water quality protected from land erosion sediment. The grazing land resources would be conserved and wildlife habitat enhanced, resulting in improved hunting and other recreational opportunities. Business and employment opportunities would then be increased. However, given that this project would take ten years to complete, these benefits would not be available at the end of the grant funding cycle.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Region I Asphalt Roads

GRANT AMOUNT REQUESTED: $200,000

TOTAL PROJECT COST: $200,000

PROJECT DESCRIPTION

Roads at several recreational sites around Flathead and Whitefish Lakes have deteriorated to the point that they can no longer be patched, which creates unsafe conditions for users of the sites. Without repaving, the roads will remain with deep potholes and eventually return to a gravel surface.

This project would repave selected roads that would be prioritized at a later date.

TECHNICAL FEASIBILITY ASSESSMENT

Construction could begin in late 1985 or early 1986 and be completed within the biennium. More design information would be needed before a technical feasibility assessment would be completed.

FINANCIAL ANALYSIS

Total Project Cost		$200,000
Funding Sources	Amount	
1. Legacy	$200,000	
Total Funding Contributions		$200,000

Forty thousand dollars in the project budget would be for professional and technical costs, the remainder would be for construction costs (materials, labor, and equipment).

ENVIRONMENTAL IMPACT ASSESSMENT

More information on the project is needed before an environmental impact assessment can be done.

PUBLIC BENEFITS ASSESSMENT

The users of the recreation sites included in this project would benefit from the work completed. Additionally, the project would help to maintain and improve recreational lands in Montana for the general public.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Region 5 Road Maintenance

GRANT AMOUNT REQUESTED: $84,000

TOTAL PROJECT COST: $84,000

PROJECT DESCRIPTION

Roads on recreational sites in the Billings vicinity have deteriorated, creating unsafe travel conditions for site users.

This project would grade and regravel selected portions of recreational site roads at various locations to be selected. Drainage would be improved in order to minimize future maintenance problems.

TECHNICAL FEASIBILITY ASSESSMENT

Construction would begin in late 1986.

A technical feasibility assessment cannot be done for this project until final project design work is completed.

FINANCIAL ANALYSIS

Total Project Cost		$84,000
Funding Sources	Amount	
1. Legacy	$84,000	
Total Funding Contributions		$84,000

Twenty-five percent of the proposed budget would be for professional and technical costs. The remainder would be for construction costs.

ENVIRONMENTAL IMPACT ASSESSMENT

An environmental impact assessment cannot be done for this project until more specific project designs are available.

PUBLIC BENEFITS ASSESSMENT

The general public would benefit from this project because it would help to protect recreational sites in Montana. The primary beneficiaries would be residents of the Billings area who would use the areas.

RECOMMENDATION:

No funding is recommended for this project.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: Riparian Reclamation and Conservation Project

GRANT AMOUNT REQUESTED: $200,000

TOTAL PROJECT COST: $200,000

PROJECT DESCRIPTION

Vegetation growing along streams (riparian vegetation) plays a significant role in the conservation of soil and water. It provides a buffer zone by trapping soils running off the lowlands and also captures soils being carried downstream in high spring flows. Healthy riparian vegetative zones have been shown to increase summer low flows with water stored in banks. Riparian vegetation also moderates the impact of flooding. It bends, but usually does not break. Riparian lands absorb some of the force from the spring flow. Riprap, concrete, and other forms of bank protection cannot bend and the river must release its force either downstream or upstream causing erosion of once stable streambanks. Streamside vegetation also harbors a diverse collection of wildlife. It serves as cover and cools summer flows for fish; it also provides visual isolation between those using streams for recreation and those who use the bottom lands for other purposes.

Controlling streams to protect farm and ranch lands, buildings, and other structures has resulted in spending millions of dollars to construct dikes, riprap, levees, jetties, and channelization of streams. However, it is becoming increasingly apparent that most of the "solutions" only created larger, more dispersed problems. These methods are also expensive and have reduced public benefits from the loss of fish, wildlife, soil, and water.

This project consists of establishing a program to promote and assist reclamation and protection of riparian vegetation. Included in the program are development of eligibility criteria for individual riparian vegetation projects, applications, and acceptable management methods. The major component of the program is the establishment of a cost-sharing fund to assist funding of specific riparian vegetation reclamation and protection projects.

TECHNICAL FEASIBILITY ASSESSMENT

Riparian vegetation reclamation and protection techniques are conceptually very simple, straightforward, and technically feasible. An example riparian vegetation and protection project would be to fence livestock away from the majority of streambank area along a stream and construct special access areas to the stream for livestock watering. Some reseeding of desirable plant species and control of any undesirable species may also be included in the project. The major obstacle to implementing projects such as the example discussed is often an unwillingness on behalf of the affected landowner to participate, especially in the costs of the project. Many landowners also dislike the idea of setting any portion of their land essentially off-limits to livestock use. Such problems can be overcome, however, and the riparian vegetation management idea is gaining acceptance in Montana.

FINANCIAL ANALYSIS

Total Project Cost		$200,000
Funding Sources	Amount	
1. Legacy	$200,000	
2. Applicant	-0-	
Total Funding Contributions		$200,000

Although not listed in the above table as a contribution, the applicant proposes to use the cost-sharing fund to meet 75 percent of specific project costs. The participating landowner would then have to provide 25 percent of the specific project costs either through cash payment or by providing equivalent in-kind services. Of the total project cost, $2,000 would be budgeted for printing of applications and informational brochures, and the remaining $198,000 would be budgeted for design and construction of specific projects. The applicant would provide all project administration at no cost to the project. Conservation district and Montana Department of Fish, Wildlife and Parks personnel would provide technical assistance and project evaluation on specific projects at no cost to the project.

ENVIRONMENTAL IMPACT ASSESSMENT

Riparian vegetation reclamation or protection projects typically involve very little or no construction near streams, other than for fence construction or similar activities. This project would have a net positive impact on the environment. No significant short- or long-term adverse environmental impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

The project would provide demonstration and technical assistance to promote the wise use of Montana's natural resources and would protect the state's renewable resources through sound soil and water conservation. The improved condition of the streambank areas of the impacted streams, improved water quality, and improved wildlife habitat would provide compensation for the project. Primary benefactors would be affected landowners and downstream area users of the impacted streams.

RECOMMENDATION

The project does not appear to have demonstration value since the concept has apparently been used and evaluated several times before. It also appears that such projects can be funded with existing programs. No funding is recommended for this project.

APPLICANT NAME: Montana Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY: South Sandstone Dam Repair

GRANT AMOUNT REQUESTED: $1,565,000

TOTAL PROJECT COST: $1,565,000

PROJECT DESCRIPTION

South Sandstone Dam is located in Fallon County about seven miles south of Plevna. The dam impounds 880 acre-feet of water, which is used for irrigation and recreation. In 1981 the U.S. Army Corps of Engineers inspected the facility under the National Dam Safety program. The dam has been classified as a high-hazard structure because of potential loss of life in the event of a dam failure. The Corps determined that the dam had many deficiencies that needed to be remedied. In 1983, the legislature authorized $100,000 to further address the problems and fund the required repairs. The project consulting engineer has since determined the problems with the dam are much more severe than originally anticipated. Based on this analysis, the Department of Fish, Wildlife and Parks (DFWP) has requested $1,565,000 in grant funds to construct a major rehabilitation of the South Sandstone Dam project.

TECHNICAL FEASIBILITY ASSESSMENT

The consulting engineer's report, which has identified major rehabilitation requirements, is not complete at this time. However, the magnitude of the anticipated project cost clearly warrants a delay in funding until the scope of the improvements and the benefits of the associated costs can be considered in detail.

FINANCIAL ANALYSIS

Total Project Costs		$1,565,000
Funding Sources	Amount	
1. Legacy	$1,565,000	
2. Applicant	-0-	
Total Funding Contributions		$1,565,000

RECOMMENDATION

No funding for this project is recommended pending consideration of the costs and benefits associated with the extensive rehabilitation requirements.

APPLICANT NAME: Montana Department of Health and Environmental Sciences, Water Quality Bureau

PROJECT/ACTIVITY: Non-point Water Quality Improvement Project

GRANT AMOUNT REQUESTED: $150,000

TOTAL PROJECT COST: $150,000

PROJECT DESCRIPTION

Non-point pollution has been identified as the major source of water quality degradation in the state of Montana. Non-point water quality problems are often difficult to identify and are difficult and costly to solve.

Essentially the project consists of establishing a fund to finance study, design, and construction activities associated with solving particular non-point pollution problems state-wide. No specific projects have been identified.

TECHNICAL FEASIBILITY ASSESSMENT

The technical feasibility and cost effectiveness of solving non-point pollution problems is site- and problem-specific. In other words, it is technically feasible and cost-effective to solve some non-point pollution problems, but not others. Without having site- and problem-specific information, including correction methods and estimated costs, it is impossible to evaluate the technical feasibility and cost-effectiveness of the project.

FINANCIAL ANALYSIS

Total Project Costs		$150,000
Funding Sources	Amount	
1. Legacy	$150,000	
2. Applicant	-0-	
Total Funding Contributions		$150,000

The budget for the project shows $51,600 for professional/technical costs and $98,400 for construction costs. No applicant contract administration funds are budgeted.

ENVIRONMENTAL IMPACT ASSESSMENT

If successful, the proposed project would have a net positive environmental impact. No resultant significant adverse environmental impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

The project would protect the state's renewable resources through sound soil and water conservation. Primary beneficiaries of the project would typically be those water users downstream from selected sites.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana Department of Health and Environmental Sciences, Water Quality Bureau

PROJECT/ACTIVITY: Water Quality Protection Fund

GRANT AMOUNT REQUESTED: $148,480

TOTAL PROJECT COST: $148,480

PROJECT DESCRIPTION

Many instances of leaking petroleum pipelines and storage tanks and hazardous waste spills have occurred in Montana over the last several years. In many of these cases, ground water has become contaminated. In the last two years, the applicant has documented more than forty cases of ground water contamination resulting from such incidents. Contamination of ground water as a result of leaking petroleum storage tanks and spills is considered a major threat to water quality.

The applicant, under authority provided by the Water Quality Act, investigates such cases and can require the responsible parties to clean up the affected area. However, due to the complexity of ground water contamination problems, it is difficult and expensive to determine the extent of aquifer contamination and identity of the responsible party.

The project consists of providing a contingency fund to be used by the applicant to finance the investigations described above. Such funds would be used to hire the experts needed, such as hydrogeologists, well drillers, backhoe operators, etc., as well as to conduct any necessary testing to allow the applicant to complete the investigations quickly. The funds would be administered by the applicant.

TECHNICAL FEASIBILITY ASSESSMENT

A project such as the one proposed by the applicant is technically feasible. It would provide for funding necessary to allow the applicant to respond quickly, minimizing the effects on ground water and identifying those responsible.

FINANCIAL ANALYSIS

Total Project Costs		$148,480
Funding Sources	Amount	
1. Legacy	$148,480	
2. Applicant	-0-	
Total Funding Contributions		$148,480

The project budget would include $5,000 for administrative costs, $83,000 for professional and technical costs (including $20,000 for analytical work), $40,000 for equipment, and $20,480 for contingencies. Contract administration would be handled by the applicant at no cost to the project.

With a fund such as this, the actual amount of expenditures would depend on the number, type, and magnitude of the contamination cases that developed during the biennium.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would have a net positive impact on the environment. No adverse environmental impacts are anticipated.

PUBLIC BENEFITS ASSESSMENT

The project would protect the state's renewable resources and provide for investigation and remediation of sites where hazardous and toxic wastes threaten the environment. Ground water users in the areas affected would benefit from the project. Protection of the ground water resource would provide compensation for the costs.

RECOMMENDATION

The legislation authorizing the legacy program provides for contingency funds for such problems as addressed with this project. Therefore, the contingency funds desired by the applicant would be created and would be available as needed on a case-by-case basis for specific projects. No funding is recommended for this project because it would be a duplication of programs. If a contingency fund is not created for the legacy program, this proposal is recommended for full funding.

APPLICANT NAME: Montana Department of Natural Resources and Conservation and Rock Creek Water Users Association

PROJECT/ACTIVITY: Cooney Dam Rehabilitation

GRANT AMOUNT REQUESTED: $260,000

TOTAL PROJECT COST: $260,000

PROJECT DESCRIPTION

Cooney Dam is located on Red Lodge Creek in Carbon County near Boyd, Montana. The dam is owned by the Department of Natural Resources and Conservation (DNRC). The Rock Creek Water Users Association (RCWUA) purchases water from the dam and also operates the facility.

Planning for a major construction project to improve the facility was undertaken by RCWUA and DNRC in the late 1970s. Construction work under this project was completed in 1982. An early financing plan for the project required a $260,000 federal grant from the Land and Water Conservation Fund along with loan and grant funds from other sources to complete the funding package. Although the project apparently qualified for the federal grant, the $260,000 was not received because of a complex series of events. The problems included delays in acquisition of other project financing and a misunderstanding of the project funding structure by the various agencies involved. The result was loss of the grant because of federal funding cutbacks by the Reagan administration. RCWUA has requested $260,000 in legacy program funds to replace the Land and Water Conservation Funds originally authorized for the project by the 1979 Legislature.

TECHNICAL FEASIBILITY ASSESSMENT

The Cooney Dam rehabilitation project has been constructed and is operating as planned. Funds for the project came from a $1,447,000 zero-interest loan from the Bureau of Reclamation and a $591,300 grant from the State of Montana RIT fund. RCWUA and DNRC were able to construct the project improvements as planned without the $260,000 federal grant because the low construction bid was $400,000 below the amount expected in the original financing plan.

FINANCIAL ANALYSIS

Total Project Costs $2,038,300

Funding Sources	Amount
1. Legacy	$ 260,000
2. Applicant	-0-
3. State of MT (RIT)	591,300
4. Bureau of Reclamation	1,447,000 (zero-interest loan)

Total Funding Contributions $2,298,300

The RCWUA currently has arranged funding to cover the entire project cost. Additional funding from the requested $260,000 legacy program grant will be applied to shorten the term of the existing $1,447,000 loan from the Bureau of Reclamation.

ENVIRONMENTAL IMPACT ASSESSMENT

None.

PUBLIC BENEFITS ASSESSMENT

The RCWUA feels the Land and Water Conservation Fund grant money was obligated by the Department of Fish, Wildlife and Parks and the legislature to reimburse the association for public recreational benefits provided by the project. These benefits are now being provided as a result of the Cooney Dam improvements.

RECOMMENDATION

No funding is recommended for this project, since the application contemplates refunding of work already completed.

APPLICANT NAME: Montana State University

PROJECT/ACTIVITY: Museum of the Rockies Natural History Building

GRANT AMOUNT REQUESTED: $2,000,000

TOTAL PROJECT COST: $5,000,000

PROJECT DESCRIPTION

The Museum of the Rockies proposes to construct an addition to its facilities in Bozeman. In this region there is no natural-history museum that interprets or relates the area's natural and cultural history. This facility would provide for development and display of fossils and early-man artifacts found in this area, many of which are found nowhere else in the world. Montana is rich in archaeological and paleontological sites; this natural heritage should be preserved and made available to the public. In addition to appreciation by Montanans these displays would attract tourists, and visitors at the Museum could increase from 50,000 to 200,000 per year.

TECHNICAL FEASIBILITY ASSESSMENT

Planning for this project began in 1981 with a $110,000 architectural planning grant from the State of Montana which provided for planning and design of the proposed facility to add 47,000 square feet to the present 31,000.

Displays would trace the area's development using exhibits arranged in chronological order as follows: 1) a planetarium to explain the birth of our solar system, 2) geology exhibits interpreting the birth of the Rockies and their mineral deposits, 3) dinosaurs focusing on eggs, embryos, babies,

juveniles, and adults from the world-famous Choteau facility, 4) an early-man exhibit focusing on the Townsend site, 5) the recent history of our region, 6) a western art gallery, and 7) contemporary exhibit hall that would allow presentation of national shows.

If funds are granted through this program, construction would begin in the spring of 1986 and be complete by late summer of 1987.

FINANCIAL ANALYSIS

Total Project Cost		$5,000,000
Funding Sources	Amount	
1. Legacy	$2,000,000	
2. Private Donations-Raised	2,000,000	
3. Private Donations-to be raised	1,000,000	
Total Funding Contributions		$5,000,000

Since 1983, the Museum has obtained commitments for $2 million in private donations which include: National Endowment for the Humanities Challenge Grant--$300,000, National Endowment for the Humanities Planning Grant--$15,000, National Science Foundation--$100,000, and Burlington Northern Foundation--$100,000. If the Museum is granted $2 million it will proceed with construction and with the provision of state funds as an evidence of support, it would be able to raise the additional $1 million needed for exhibits and equipment.

The construction cost per square foot is reasonable.

ENVIRONMENTAL IMPACT ASSESSMENT

This project would allow for accelerated development of Montana's archaeological and paleontological resources. There would be local disturbances as well as those associated with the construction of the building.

PUBLIC BENEFITS ASSESSMENT

This project would provide for the development and demonstration of the wise use of Montana's natural resources. It would allow the public to share this resource.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana State University

PROJECT/ACTIVITY: Study of the Potential for Development of a Commercial Whitefish Industry in Montana

GRANT AMOUNT REQUESTED: $72,368

TOTAL PROJECT COST: $86,768

PROJECT DESCRIPTION

Montana State University, through its Department of Agricultural Engineering, proposes a "systematic engineering feasibility" study to determine the potential for a commercial whitefish industry in Montana. The study would identify techniques for handling, processing, and distributing quantities of whitefish, would establish population and harvesting limits for the whitefish, and would conduct a prefeasibility analysis of the market potential for the fish. The applicant contends that the new industry would provide substantial employment opportunities and enhance the trout fishery in the state by reducing food and habitat competition from the whitefish, thus contributing to the tourism industry.

TECHNICAL FEASIBILITY ASSESSMENT

As the principal support for the study, the whitefish population is described as very high and potentially capable of sustaining a fishing industry. Two scenarios are presented, one with active state participation. In this approach, the state would establish fishing districts and control production in these districts. The fishing could be done within existing regulations although more flexible regulations were contemplated. Design specification for local mobile processing plants were described. A broker would represent the industry at local, regional, national, and international levels. The second scenario would also use the district approach to identify the fishery but other activities would be carried out through the free market approach. However, for both scenarios, temporary, unspecified state support is considered necessary at the processing and wholesaling levels to develop market and market strength. The feasibility of this approach for establishing a major new food industry is uncertain because no private sector interest or capability in any phase of the project is described, although private sector participation is expected. Marketing experts in the Department of Commerce said that the failure of numerous attempts by Montana corporations to establish a trout market on the west coast was not an encouraging precedent for this proposal. They also discussed the sizable capital investment needed to initiate a new industry and the prerequisite of a major market analysis as constraints to eventual implementation.

The studies described in the proposal are scheduled for completion in the biennium although further development grants of an unspecified nature are anticipated.

FINANCIAL ANALYSIS

Total Project Cost		$86,768
Funding Sources	Amount	
1. Legacy	$72,368	
2. Applicant	$14,400	
Total Funding Contributions		$86,768

The $86,768 project budget would include $41,810 for salaries, $17,750 for contracted services, $11,900 for supplies and travel, and $15,308 for miscellaneous and indirect costs to the university. The applicant proposes to contract with the Department of Fish, Wildlife and Parks for the work required to compile the population and harvesting data on the whitefish. University professors and graduate assistants would complete the technical work related to fish processing and distribution and a consultant is anticipated for the marketing analysis.

ENVIRONMENTAL IMPACT ASSESSMENT

This proposal would have no impact on the environment; the anticipated long-term result may. The whitefish habitat is, in some instances, fragile. Access in numbers sufficient to support a commercial fishing industry may cause environmental damage.

PUBLIC BENEFITS ASSESSMENT

The proposal anticipates public benefits by providing employment opportunities in a new fishing industry and an enhanced tourism industry.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana State University, Cooperative Extension Service

PROJECT/ACTIVITY: Effects of Three-Year Sheep Grazing on Knapweed Infested Rangeland

GRANT AMOUNT REQUESTED: $56,435

TOTAL PROJECT COST: $69,852

PROJECT DESCRIPTION

Spotted knapweed deserves its rating as western Montana's number-one problem. Annual forage losses to the livestock industry approach $5.6 million. However, the weed also threatens the watershed, wildlife, and aesthetic qualities of Montana. Soil erosion is expected to double when

knapweed replaces perennial bunchgrass. Wildlife also suffer because invasion by knapweed destroys the vegetative diversity that deer, elk, and small game and non-game species require. The result is the deterioration of environmental quality.

Research at Montana State University (MSU) has shown that spotted knapweed can be controlled with herbicides. Although the most effective treatment is Tordon, many Montanans have been reluctant to spray because of environmental concerns and the high cost of the chemical. These landowners rationalize that biological control, whether insects or sheep, is a realistic alternative. However, research has not determined whether sheep grazing is a viable alternative for knapweed-infested rangeland. Instead, field observations suggest that knapweed is able to flower and persist on severely overgrazed range.

A professor at the University of Montana raises about 70 ewes on irrigated pasture. He does not agree with published data about knapweed being poor forage, and feels that sheep grazing is both a control and a viable use of spotted knapweed. However, grazing an animal to control weeds in an intensive management scheme may be much more feasible than it would be on extensively managed rangeland.

Because the effects of livestock grazing on spotted knapweed have not been adequately studied and misinformation about the method exists, MSU proposes to assess and demonstrate the effects of sheep grazing on spotted knapweed-infested range.

TECHNICAL FEASIBILITY ASSESSMENT

This three-year study would be conducted in western Montana, on native range infested with spotted knapweed. In order to replicate the study three times, the site would be divided into twelve pastures. Each pasture would be five acres in size.

Sheep would be used to evaluate the possibility of grazing animals on spotted knapweed. The grazing season would extend from early May through September. It would be necessary to adjust sheep numbers within a pasture to ensure that the proper amount of forage was used.

Vegetation measurements would include herbage production, range trend, and cover. Individual animal weights would be recorded at the beginning and end of the grazing periods. A total of six animals would be grazed the second year. Three would be in the pasture used at 30 percent and the remainder would be in the pasture used at a 90 percent level. The composition of the diet would be examined at three different periods (early, middle, and late) of the grazing season. A rainfall simulator and catchment basins would be used to analyze infiltration, sediment production, and runoff.

Television films, newspaper articles, field tours, and Extension Service bulletins would be used to disseminate the results of the study to rangeland users in Montana. These results would also be of interest to the general public throughout Montana.

The need for this type of control has been well documented. While sheep grazing has been shown to be successful in some areas, it has not been demonstrated through a scientifically controlled project effort. The methods proposed in this study are appropriate.

FINANCIAL ANALYSIS

Total Project Cost		$69,852
Funding Sources	Amount	
1. Legacy	$56,435	
2. Applicant	13,417	
Total Funding Contributions		$69,852

The legacy grant would fund the first two years of the study, and the Cooperative Extension Service would finance the project for the third and final year.

Salaries and benefits for a range specialist and range technician would total $34,648. Travel costs would be $8,562. Land rental, fencing, drinking tubs, scale, water truck rental, and veterinarian services would cost $7,896. Inflation, contingency, and indirect costs would add $18,746. Livestock would be purchased using a MSU revolving fund. They would be sold in the fall, with the proceeds returning to MSU.

Travel costs appear excessive, as do inflation, contingency, and indirect charges. Other estimates are adequate and reasonable. No other funding sources were identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project. If control efforts prove successful, a safe, economical means of controlling knapweed would be established. This could result in positive environmental effects by reducing the adverse impacts of knapweed, and eliminating the need for massive amounts of chemical herbicides.

PUBLIC BENEFITS ASSESSMENT

The project would protect the state's renewable resources through biological control of knapweed. Soil erosion, water quality impacts, and depletion of forage would be lessened. All Montanans would benefit if this study provides a safe and economical method of controlling knapweed.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Montana State University, Cooperative Extension Service

PROJECT/ACTIVITY: Prescribed Burning to Improve Range Resources in Southwestern Montana

GRANT AMOUNT REQUESTED: $44,015

TOTAL PROJECT COST: $68,089

PROJECT DESCRIPTION

In the counties of Beaverhead, Madison, Jefferson, Powell, Silver Bow, Deer Lodge, and Granite, the applicant has determined that much of the area produces less than half its potential native forage due to the infestation of big sagebrush. The infestation is severe enough to be an economic detriment, cause the loss of wildlife habitat and create watershed instability.

This project would be a coordinated effort to provide the education and training necessary for ranchers and agency personnel to adapt prescribed burning as a management tool to improve the productivity of sagebrush-infested rangeland in southwestern Montana.

TECHNICAL FEASIBILITY ASSESSMENT

Costs and environmental problems have strongly curtailed the use of herbicides and mechanical methods, leaving burning as the most common control measure in use in that area today.

Technically, prescribed burning is acceptable. The Bureau of Land Management (BLM), Forest Service, and Department of State Lands have used this method for years. Agency personnel within these organizations have been extensively trained to carry out prescribed burning in safe conditions. They conduct demonstration projects and give technical assistance to private landowners as requested.

Big sagebrush is a part of the climax vegetation and will seek to re-establish, particularly under poor management conditions.

FINANCIAL ANALYSIS

Total Project Cost		$68,089
Funding Sources	Amount	
1. Legacy	$44,015	
2. Cooperative Extension Service	$24,074	
Total Funding Contributions		$68,089

The proposed budget appears to require excessive funds for liability insurance; the cost of $700 per day per expert to conduct demonstrations appears excessive.

The financial gain to the rancher from prescribed burning is normally good in the long term--forage production would increase two or three times under good management. It is questionable if the extensive training is needed or its cost justified.

ENVIRONMENTAL IMPACT ASSESSMENT

Burning creates short-term negative impacts through air pollution, and some sage brush is desirable in the plant community for wildlife habitat and as a browse plant. The major benefit is the increased use of the soil and water resource through increased forage production.

PUBLIC BENEFITS ASSESSMENT

Economic benefits to the ranching communities of southwestern Montana are primary. This project deals directly with an education program to carry out prescribed burning in a safe, controlled manner, thus avoiding potential large range or forest fires that could result from improperly planned burns. This aspect would possibly avoid property damage and/or loss of life.

RECOMMENDATION

DNRC has assessed that prescribed burning is in use, sources of assistance are available when needed, and the need for a coordinated effort does not justify the grant. No funding is recommended for this project.

APPLICANT NAME: Montana State University, Department of Agricultural Engineering

PROJECT/ACTIVITY: Development of Native Vegetation Seeder for Re-establishing Diverse Ecosystems on Disturbed Lands

GRANT AMOUNT REQUESTED: $109,483

TOTAL PROJECT COST: $119,731

PROJECT DESCRIPTION

A mechanical device for simultaneously seeding diverse native and introduced plant species in accordance with individual planting depth, germination, moisture, and spatial distribution requirement needs to be developed. It must be readily adjustable in order to successfully operate under variable topography, soil, and moisture conditions. It must be rugged, easily adjustable, reliable, and practical in order to withstand heavy field use.

A microprocessor-controlled seeder would be designed specifically for use with native species for revegetation work on disturbed lands. It would have the necessary hardware, operational flexibility, and performance capabilities to meet requirements noted above. The machine would be able to:

1) precisely meter seeds of variable size, shape, and density,
2) combine individual seed species at given rates with other species to form specified seed mixtures,
3) plant metered seed at a specified application rate independent of normal ground speed variations,
4) distribute individual species or species mixtures within unit areas (generating mosaic-type patterns) of predetermined size and shape,
5) leave predetermined unit areas with no seed for subsequent tree and shrub planting,
6) allow rapid, in-field adjustment of seeding rates, seed mixtures, and seeding patterns,
7) create an optimum seedbed for individual plant species, and
8) fertilize specified unit areas at predetermined rates.

The unit would generate variable patchwork patterns of seeded areas, hence the name mosaic seeder.

TECHNICAL FEASIBILITY ASSESSMENT

To date the only work that has been done on this project has been the formulation of ideas into an organized budgeted plan. Technically, steps would be taken to develop the microprocessor control system itself, the seed metering mechanism, the seed planting mechanisms, fertilizer mechanisms, and to implement these into a compatible planting machine. No other machine has been able to make the rapid and varied changes in the seeding process that are necessary under re-establishment processes. Development is expected to be complete within the biennium though proof of usefulness may not be determined in that time.

FINANCIAL ANALYSIS

Total Project Cost		$119,731
Funding Source	Amount	
1. Legacy	$109,483	
2. MSU (Salaries and Benefits)	10,248	
Total Funding Contributions		$119,731

A project budget was submitted; salaries and wages appear inflated, particularly in view of a project that could have a strong monetary return to Montana State University and the project particlpants. Reviewers have concurred that more than adequate funds were requested to complete the project.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no negative short-term impacts to the environment. Development of the seeder would lead to the reclaiming of problem vegetative areas in a much shorter period of time, giving environmental benefits through erosion control and management of the natural resource.

PUBLIC BENEFITS ASSESSMENT

Reclamation or re-establishment of a vegetative cover leads to general public benefits through erosion control, soil and water management, wildlife management, and resource conservation. Direct benefits may be made to the ranching public through additional forage production.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana State University, Department of Biology

PROJECT/ACTIVITY: Influence of Acid Precipitation on Aquatic Resources

GRANT AMOUNT REQUESTED: $66,605

TOTAL PROJECT COST: $66,605

PROJECT DESCRIPTION

Atmospheric deposition of mineral acids influences the water quality of many lakes and streams, as demonstrated by the recent acidification of hundreds of aquatic ecosystems in areas of Europe and eastern North America. The acidification of surface waters and the consequent mobilization of metals from benthic sediments lead to changes in the structure and functioning of aquatic communities and to the eventual elimination of sensitive aquatic species. Organisms affected include trout and other salmonids, as well as various amphibians, molluska, crustaceans and insects.

Recent evidence suggests that soft-water ecosystems in certain alpine and subalpine watersheds of the western United States may become acidified even by slight increases in precipitation acidity. The Beartooth Mountains of south-central Montana contain surface waters particularly sensitive to acidic inputs. Continued development of fossil fuel and mineral resources in Montana, and in neighboring states and provinces, could conceivably increase regional emissions of acid precursors, resulting in the acidification of these and other weakly buffered surface waters within the state. Acidification of such water could lead to the demise of local blue ribbon trout fisheries, which would result in a significant loss of tourist revenue to Montana. Montana State University proposes to examine in detail the influence of acid precipitation on the vulnerable aquatic resources in Montana.

The proposed study would examine the influence of acidification on the chemical limnology of the Hell Roaring Creek drainage, a high acid-sensitive alpine watershed in the eastern portion of the Absaroka-Beartooth Wilderness Area in south-central Montana. The research would include the determination of the extent to which surface water chemistry already has been affected by acidic inputs; the development of laboratory model ecosystems that would permit the year-round investigations of metal mobilization under various pH regimes; and the field validation of laboratory mobilization models. This research would complement studies of biological responses to acidification in the Hell Roaring Creek watershed, planned for spring 1985 through fall 1986.

TECHNICAL FEASIBILITY ASSESSMENT

Water samples from all major streams and lakes in the Hell Roaring Creek drainage would be analyzed on-site for conductivity and pH; alkalinity determinations and sample filtration/preservation would be performed at a temporary field laboratory. Additional chemical analyses would be conducted on the campus of Montana State University. Data on pH, and levels of Ca^{+2}, SO_4^{-2} and strong acidity, would provide a means of estimating the degree of acidification within the watershed.

Aquaria containing water and sediment from a representative lake and a representative stream within the watershed would be used in laboratory experiments to test the effect of acidification on metal mobilization. These experiments would lead to the formulation of mathematical models of metal mobilization in the Hell Roaring Creek watershed that would be applicable to other granitic watersheds in Montana. This model should also be applicable to acid-sensitive aquatic systems throughout the world. Permission to conduct field experiments in the Absaroka-Beartooth Wilderness Area has been tentatively granted by the Forest Service; the agency is now processing the special-use permit application. The proposed project could be completed in two years.

Technical alternatives to this research include the long-term monitoring of precipitation and surface water chemistry and the experimental wholesale acidification of select lakes and streams within the watershed. Both alternatives would require a substantial amount of personnel and equipment, and are prohibitively expensive given the present scope of funding. Moreover, the acidification of entire aquatic ecosystems raises substantive legal and ethical questions in this case, because the Hell Roaring Creek drainage lies within a designated federal wilderness area.

The results of this study would be published in peer-reviewed international journals and presented at scientific conferences. Because the study would provide an initial indication of the geochemical response of Montana alpine watersheds to atmospheric inputs of strong acids, findings would be of interest to individuals and agencies concerned with environmental monitoring, environmental protection and resource management. The data also would provide technical support for regulatory decisions affecting air quality and water quality in Montana.

Reviewers had technical questions that could be addressed in the final plan for the project. The current proposal does not contain all the technical data necessary to make a thorough review.

This work could possibly duplicate some work being conducted or planned by the Environmental Protection Agency.

FINANCIAL ANALYSIS

Total Project Cost		$66,605
Funding Sources	Amount	
1. Legacy	$66,605	
2. Applicant	-0-	
Total Funding Contributions		$66,605

Salaries and benefits total $39,109. Equipment, supplies and material costs would be $5,495, and travel, computer, operations, and publication costs would total $10,900. Indirect costs to MSU would be $11,101. Cost estimates appear reasonable and adequate.

The applicant would not not contribute to the project, nor has it identified other funding sources. The EPA should be contacted for financial support; it has recently increased funding for research on acid rain.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this study. Positive impacts may occur if study results prompt solutions and prevention of acid precipitation impacts to aquatic resources.

PUBLIC BENEFITS ASSESSMENT

The proposal would provide research to assess past or potential environmental damage resulting from natural resource development. All Montanans would benefit if results promote solutions and prevention of acid precipitation impacts to Montana's aquatic resources.

RECOMMENDATION

No funding is recommended for this project because of substantial work being done in the area of acid rain by EPA and USGS, and because of the availability of funds from these agencies for acid-rain research efforts.

APPLICANT NAME: Montana State University, Department of Biology

PROJECT/ACTIVITY: Restoring Stream Habitat in Lowland Creek

GRANT AMOUNT REQUESTED: $229,421

TOTAL PROJECT COST: $239,643

PROJECT DESCRIPTION

Placer mining has completely disrupted the stream channel and much of the flood plain of the lower four miles of Lowland Creek. The damage extends from the hamlet of Ferdinand almost to the creek's junction with the Boulder River.

The materials of the former stream bed are now in hundreds of uniform, steep-sided tailings piles that lie in rows following the trough of the valley. The stream is in an unnaturally straight and monotonous course beside the rows of tailings.

Lowland Creek could be made into much better habitat for trout. Through this project, three miles of disrupted stream habitat would be converted into five to six miles of trout habitat by rerouting the present straight, shallow course into a meandering course that simulates the natural condition with pools, riffles, and stream-edge hiding cover. Unsightly and obstructive tailings piles would be leveled for multiple recreational use of the valley bottom land.

TECHNICAL FEASIBILITY ASSESSMENT

Project objectives are (1) to remedy placer mining damaged stream habitat for trout, (2) to have the restoration serve as a demonstration of state-of-the-art technology that can be applied in streams similarly affected by mining, and (3) to conduct research evaluating physical and biological effects of the restoration, with resulting information used to refine the technology.

In three of the four miles of Lowland Creek affected by mining, earth-moving equipment would be used to spread the material of the tailings piles within the trough of the valley and to dig an improved, sinuous stream channel. For research purposes, two half-mile sections of stream would be left in present condition as "comparison sections." The restored stream sections would be nearly doubled in length by carving the new channel. Bends, pools, and shallow riffles would be created in the channel, using structures such as current deflectors, bank-cover devices at pool margins, and log stabilization structures.

Research in this project would include measuring changes in channel morphology and inventorying trout populations. This would be done before construction, again a month or more after construction, and in subsequent years as often as funding permits.

Products from this project would include: (1) conversion of disturbed bed stream into recreational area by creation of trout habitat and elimination of unsightly tailings piles, (2) demonstration of techniques used, and (3) an illustrated report describing the project and its results.

This project could be accomplished within the biennium. Cooperating agencies would include DFWP and the U.S. Forest Service.

FINANCIAL ANALYSIS

Total Project Costs		$239,643
Funding Sources	Amount	
1. Legacy	$229,421	
2. Applicant	7,222	
3. DFWP (in-kind)	3,000	
Total Funding Contributions		$239,643

The professional/technical costs for this project would be $46,600, construction costs would be $134,000, administration costs would be $6,300, and MSU indirect cost plus contingency costs would be $52,743.

Generally, costs estimated for this project appear reasonable.

ENVIRONMENTAL IMPACT ASSESSMENT

The long-term impacts of this project would include: (1) improved water quality, (2) a more stable stream, (3) better aesthetic qualities of the area, and (4) a vastly improved fishery.

Short-term impacts may be severe, such as sediment in the stream, but this could be minimized with careful construction supervision. This project would need to acquire a "Natural Streambed and Land Preservation Act" permit (issued by the local conservation district) and a "Short-Term Exemption to Exceed Turbidity Standards" from the Water Quality Bureau before any construction could begin.

PUBLIC BENEFITS ASSESSMENT

Benefits for the general public and the future users of the area would include: (1) reclamation of a mined area, (2) enhancement of a recreational resource, and (3) research, demonstration, and technical assistance to promote the wise use of natural resources.

Primary benefactors include area recreationists and landowners.

RECOMMENDATION

No funding is recommended for this project. Reviewers have concluded that there is little need and urgency for a project in this area.

APPLICANT NAME: Montana State University, Department of Civil Engineering/Engineering Mechanics

PROJECT/ACTIVITY: Guidelines for Assessing Environmental Impacts of Small-Scale Hydropower Projects

GRANT AMOUNT REQUESTED: $22,200

TOTAL PROJECT COST: $22,200

PROJECT DESCRIPTION

Development of commercial small-scale hydropower generation facilities is presently underway at numerous locations throughout Montana and may become an important industry state-wide. Several state agencies, including the Department of Natural Resources and Conservation (DNRC), the Department of Fish, Wildlife and Parks (DFWP), and the Department of Health and Environmental Sciences (DHES), receive numerous requests to review proposed hydropower projects. Requests routinely require agency personnel to make judgments concerning things such as potential project impact on aquatic habitat, water quality, and other environmental concerns as well as assessment of possible conflicts with other types of water use. Frequently agency personnel must also be concerned with engineering and economic feasibility.

The above agencies agree that establishment of published guidelines is essential in order to streamline the review process. Guidelines would expedite identification of possible environmental impacts from proposed projects, enhancement of inter-agency coordination in reviewing hydropower applications, and inform site developers of the nature of the review process before they submit application requests.

Montana State University (MSU) proposes to develop guidelines for the review of hydropower projects by conducting an assessment of environmental impacts of small-scale hydropower projects recently developed across the

United States, and incorporating the information into a study being conducted in Montana. Lastly, the constraints posed by developed guidelines on project design, construction, and operation would be summarized.

TECHNICAL FEASIBILITY ASSESSMENT

A comprehensive review of environmental impacts resulting from recent hydropower development in other states would be carried out through an extensive literature search. Information obtained would be incorporated with results from relevant studies presently being conducted by Montana state agencies. Specifically, these studies include a project by the Department of Fish, Wildlife and Parks, DHES, and MSU assessing probable impacts of small hydro development on water quality and aquatic habitat in Montana streams. Funding for this study has not been secured; an application for funding was made to the Water Development Program.

The final product would consist of a summary of agency guidelines for hydropower project application review supported by appropriate technical, engineering, and environmental information. These guidelines would be developed in cooperation with agency personnel. Constraints imposed by these guidelines on various aspects of project development would be identified and discussed. The project could be completed in two years. Reviewers feel that hydropower sites in other states do not have the unique hydrological characteristics that sites in Montana have. Therefore the guidelines would not address the major problems faced in Montana.

It may be difficult to standardize guideline recommendations given the variability of the development sites; however, the guidelines would bring together the best options.

DNRC, DFWP, and DHES have all noted a decline in hydropower applications; the need and urgency for the guidelines may not be as great as the applicant indicates.

There would be some overlap with the results of the study proposal submitted to the Water Development Program.

FINANCIAL ANALYSIS

Total Project Cost		$22,200
Funding Sources	Amount	
1. Legacy	$22,200	
2. Applicant	-0-	
Total Funding Contribution		$22,200

Salary for the principal investigator would be $16,000, with $2,500 provided for travel, supplies, and report preparation. The remaining $3,700 would be for overhead. Cost estimates appear reasonable and adequate. No other sources of funding have been considered.

ENVIRONMENTAL IMPACT ASSESSMENT

There would be no adverse environmental impacts from this project. Positive benefits may occur if guidelines result in minimizing environmental effects from hydropower development.

PUBLIC BENEFITS ASSESSMENT

The proposed project would provide research to promote the wise use of Montana's natural resources and to assess potential environmental damage from natural resource development. Benefactors would be hydropower developers who would know what review guidelines would be followed in reviewing their proposals if the guidellnes are adopted. Montanans could benefit if study results promote hydropower development that minimizes or eliminates adverse environmental impacts.

RECOMMENDATION

No funding is recommended for this project because of overlap and duplication of another study of the environmental impacts of hydropower development on small streams in Montana.

APPLICANT NAME: Montana State University, Department of Earth Sciences

PROJECT/ACTIVITY: Recovery Rates for Disturbed Timberlines, Montana

GRANT AMOUNT REQUESTED: $48,074

TOTAL PROJECT COST: $48,074

PROJECT DESCRIPTION

In many upper timberline areas of mountainous Montana, trees that once existed at their physiological limits have been eliminated intentionally through excessive logging or unintentionally by fire, smelter pollution, or abusive recreational activities. In addition, as the human population within the mountains of Montana rapidly increases, forested areas near timberline are being disturbed by housing, ski areas, roads, and industrial development. In many cases, land-use planning has not been implemented along with development. The removal of trees near their altitudinal limit results in destruction of a most important buffer and barrier zone to the basins below, increasing the occurrence of avalanches, rockfall, mud flows, and debris flows. Furthermore, the upper forest and forest-alpine tundra ecotone act as reservoirs for late-melting snowpacks. As water resources in Montana, especially on the eastern slopes, become more and more critical, the maintenance of those snowpacks in the forest become more important.

In order to determine the fragility of the forest-alpine tundra ecotone, and to assess the ability of timberline areas to recover from disturbance, a study of regeneration rates is proposed. It is therefore the objective of this proposed study to locate sites at timberline in Montana where disturbance

has occurred and determine the ability of the timberline to recover from the disturbance. The recovery ability of the timberline region would be determined by detailed analyses of current regeneration rates and recovery abilities.

TECHNICAL FEASIBILITY ASSESSMENT

Sites that have undergone disturbance would be located through consultation with biogeographers, foresters, and geographic planners as well as through careful and detailed analyses of large-scale aerial photographs. With the accompanying use of U.S. Geological Survey (USGS) topographic maps, sites disturbed by natural processes would be isolated from sites disturbed unnaturally. The unnaturally disturbed sites would be ranked according to urgency for regeneration-recovery analysis. This ranking would be done with close consultation with geographic planners, biogeographers, and foresters. According to priority, each site would be visited and an in-depth analysis of regeneration capability determined.

An assessment of the present status of the site and the present rate of regeneration would yield a valuable insight as to whether or not artificial efforts are necessary for full recovery from disturbance. This assessment would also allow an estimation of the amount and type of artificial efforts needed. Upon realizing the regeneration status of the disturbed timberline regions, geographic planners, biogeographers, and foresters could work cooperatively to assure full recovery of disturbed sites.

FINANCIAL ANALYSIS

Total Project Costs		$48,074
Funding Sources	Amount	
1. Legacy	$48,074	
Total Funding Contributions		$48,074

The budget appears adequate, with no excessive costs.

ENVIRONMENTAL IMPACT ASSESSMENT

The project deals with environmental damage within an area where impacts are quite limited. The study could give rise to protection and rehabilitation of the timberline environment; however, the proposed study is quite general and expected results are limited.

PUBLIC BENEFITS ASSESSMENT

The timberlines of Montana have had minor abuses and though some problems exist, the need, urgency, and benefits are limited.

RECOMMENDATION

No funding is recommended for this project because the need, urgency, and benefits do not appear to justify the cost at this time.

APPLICANT NAME: Montana State University, Engineering Department

PROJECT/ACTIVITY: Development and Demonstration of a Rangeland Improvement Machine for Montana

GRANT AMOUNT REQUESTED: $57,631

TOTAL PROJECT COST: $66,415

PROJECT DESCRIPTION

Improving native rangelands in Montana is of major economic importance to livestock producers attempting to upgrade their operations and provide for needed future growth in the livestock industry. Much rangeland suffers from low or intermittent annual precipitation and poor distribution of desirable forage species. In some cases, poor management practices such as overgrazing or attempted cultivation on marginal soils have upset native species distributions and accentuated existing problems.

A third-generation Rangeland Improvement Machine (RIM III) is proposed. This machine would be used for rangeland reseeding and be a simple and reliable demonstration model designed to promote RIM technology. It would be extensively demonstrated under appropriate circumstances across the state. This public-domain technology would be made available to Montana's small-machinery manufacturers for production and further commercial development.

TECHNICAL FEASIBILITY ASSESSMENT

This project, in a sense, revises an existing RIM that was thought to be well-designed but had too many moving parts, was quite cumbersome, and too large. Technically the concept of a unit machine to prepare the seedbed, seed, fertilize, and pack the soil in one operation has been around for many years and is normally considered the prime method for reseeding rangelands. Continued improvement of the machinery is expected. This machine would specifically address the following changes as compared to existing RIM II:

1. fixed row spacing
2. fewer seed boxes
3. mainframe width suitable for highway transportation
4. simplified packing wheel assembly design
5. simplified and rugged mainframe

Completion of construction and testing would take 18 months, with demonstration and promotional activities to begin at that time.

FINANCIAL ANALYSIS

Total Project Costs		$66,415
Funding Sources	Amount	
1. Legacy	$57,631	
2. MSU	8,784	
Total Funding Contributions		$66,415

The budget was adequately prepared and certainly includes enough funds to complete the project.

ENVIRONMENTAL IMPACT ASSESSMENT

Negative short-term impacts would be held to a minimum through the use of this machine as exposed earth is at a minimum compared to normal seeding operations. Primary benefits to the environment would occur from increased forage production on depleted rangelands, and soil and water conservation.

PUBLIC BENEFITS ASSESSMENT

The RIM III will be generally applicable to the open rangelands and plains area of the state. Increased forage production is the goal. The economic benefits from more grass not only aid the ranch owner but the general economic climate of the community. These exact benefits cannot be measured because there is similar equipment available today and use of the machine would be limited. The lower cost of the RIM III should make more users interested in upgrading their land and, in turn, create greater public benefits.

RECOMMENDATION

There is limited need and limited usefulness of the project and potential monetary gain for the applicant, no funding is recommended for this project.

APPLICANT NAME: Montana State University--Industrial and Management Engineering Department

PROJECT/ACTIVITY: Short Course in Water Planning Model Development

GRANT AMOUNT REQUESTED: $11,950

TOTAL PROJECT COST: $11,950

PROJECT DESCRIPTION

The project would offer a one-week short course to train state and federal agency personnel in the use of the Montana water planning model. The course would explain the technology underlying the model and provide hands-on experience with the model via an interactive computer program.

The applicant maintains that a need for training in the use of this model exists due to attrition of trained agency personnel. Documentation of this need is not included in the proposal.

TECHNICAL FEASIBILITY ASSESSMENT

The five-day course would be conducted by the originator of the Montana water planning model. Course enrollment would be limited to 12 persons and oriented towards state and federal agency personnel and university students. It would be offered in Bozeman on the Montana State University (MSU) campus

between June and September 1986 and would be free to participants. Comments received from agencies considered logical participants, however, indicate a lack of interest in or need for the short course.

FINANCIAL ANALYSIS

Total Project Costs	$11,950

Funding Sources	Amount
1. Legacy	$11,950
2. Applicant	-0-
Total Funding Contributions	$11,950

About 20 percent of the project budget would be for materials, supplies, computer time, and participant housing. The rest of the budget would be for staff costs: instructor, secretary, and student assistant.

The cost of the course seems high, considering it has been taught before and would not require substantial lesson planning.

ENVIRONMENTAL IMPACT ASSESSMENT

No impact would occur as a result of this project.

PUBLIC BENEFITS ASSESSMENT

Indirectly, this project could help to protect the natural resource environment and to provide research to assess environmental damage. Actual benefits would depend on uses of the material by course participants.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana State University, Institute of Natural Resources

PROJECT/ACTIVITY: Environmental Impact Statement Review Center

GRANT AMOUNT REQUESTED: $115,451

TOTAL PROJECT COST: $115,451

PROJECT DESCRIPTION

A federal and/or state Environmental Impact Statement (EIS) is required for almost all large-scale natural resource development projects in Montana. Local citizens and governments must devote both time and money to evaluating an EIS, to determine whether or not it satisfies their concerns. These are hidden social and economic costs of development and the EIS process. Such

concerns often are not adequately dispelled by permitting agencies, and citizens' costs are greatly escalated when they must hire outside help to critique highly technical EIS data.

The Montana University system has many specialists who can help the public to review EISs, but there is no mechanism to get that help to the people who need it. The Institute of Natural Resources at Montana State University (MSU) proposes to provide, on a two-year trial basis, such a mechanism for public service.

An advisory panel would rank natural resource development EISs in the state each year. A multidisciplinary team from MSU would then advise local affected citizens' groups that objective, technical review help is available. The team would respond to citizen concerns about the project, and help in the scoping process, as well as help to write reviews of technical studies in the draft and final EIS documents. The project would be evaluated each year by citizens' groups, to see if it continues to meet the needs of the people.

TECHNICAL FEASIBILITY ASSESSMENT

Members of the EIS review team would have expertise in meteorology, soil science, hydrogeology, sociology, and reclamation (including vegetation and wildlife). The team would advertise its availability to all public groups and request copies of all EISs prepared by state and federal agencies. An evaluation of the effectiveness of the EIS review assistance would be conducted. If efforts are successful and substantially helpful, long-term funding for the program would be sought.

The project sponsor has documented the large number of EISs produced in Montana and the large numbers of public groups that may use the service. However, the actual examples of the need for the center have not been well documented. There could be duplication of efforts between those public officials preparing the EISs and those reviewing the EISs for the citizens group; however, there would be a difference in communication about the proposed EISs. Reviewers question the ability to select an advisory council that is representative of all public interests.

Neither is it clear how the advisory panel could rank EISs without prior knowledge of what would be proposed for that time period, or who would decide what the priorities should be.

FINANCIAL ANALYSIS

Total Project Cost		$115,451
Funding Sources	Amount	
1. Legacy	$115,451	
2. Applicant	-0-	
Total Funding Contributions		$115,451

Salaries and benefits would cost $86,259. Panel members' honorariums, travel, and per diem costs would be $6,000, and office expenses would total $1,450. Reconnaissance monitoring costs would be budgeted at $2,500, and $19,242 would be provided for indirect costs to MSU.

Costs appear adequate to accomplish the proposal, but may be excessive in the areas of travel and monitoring. Reviewers question the usefulness of monitoring.

No long-term funding source has been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts would result from this project. Positive environmental impacts may result if citizens' groups are able to have more direct influence in the regulation and assessment of development.

PUBLIC BENEFITS ASSESSMENT

This proposal would provide technical assistance to promote the wise use of Montana's resources, and research to assess potential environmental damage from natural resource development. Primary benefactors would be citizens' groups and local citizens in areas of proposed development.

RECOMMENDATION

No funding is recommended for this project because of the potential for duplication of efforts between state agencies and the Institute of Natural Resources, and because the need and urgency for the EIS Review Center is not well documented.

APPLICANT NAME: Montana State University, Plant and Soil Science Department

PROJECT/ACTIVITY: Advancement of Montana State Climate Program

GRANT AMOUNT REQUESTED: $312,724

TOTAL PROJECT COST: $312,724

PROJECT DESCRIPTION

This project proposal outlines the objectives, activities, administrative organization, and support requirements for a service-oriented climate program for the state of Montana.

The project would affect a transition from the current limited and fragmented services offered by the Office of the State Climatologist and various government agencies to a coordinated program that would meet the needs of the state's citizens, while conforming to provisions of the National Climate Program Act of 1978.

TECHNICAL FEASIBILITY ASSESSMENT

Goals for the Montana State Climate Program include: (1) carrying studies and analysis of the effect of climate on agricultural production, water resources, energy requirements, and other sectors of the economy, (2) to monitor and collect atmospheric data on a state-wide and regional basis, (3) to provide advice to regional, state, and local government agencies regarding

climate-related issues, (4) to provide information to users within the state regarding climate and its effects, and (5) to provide information to the U.S. Secretary of Commerce regarding the needs of Montana residents for climate-related services, information, and data.

Evaluation of the project would use both quantitative and qualitative criteria.

The program as described in the proposal would begin July 1985 and end June 1990.

FINANCIAL ANALYSIS

Total Project Costs		$312,724
Funding Sources	Amount	
1. Legacy	$312,724	
2. Applicant	-0-	
Total Funding Contributions		$312,724

About 80 percent of the proposed budget would cover direct costs (staffing, supplies, computer services, and travel). The rest of the budget is described as indirect costs.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts are expected as a result of this project.

PUBLIC BENEFITS ASSESSMENT

Users, both public and private, of the proposed Montana State Climate Program would clearly benefit from this project which would provide a service-oriented program to meet information needs regarding climatic questions.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Montana State University, Department of Plant and Soil Science

PROJECT/ACTIVITY: Montana Areas Potentials System (MAPS) for Land Resources Technology Transfer

GRANT AMOUNT REQUESTED: $63,992

TOTAL PROJECT COST: $63,992

PROJECT DESCRIPTION

This proposal is intended to improve the transfer of technology for land management, conservation, and reclamation by developing and operating on a two-year trial basis a computer-assisted system that makes state maps (1:1,000,000 scale or smaller) showing areas similar to any sites where such technology has proven effective or would be tested.

To meet the stated objectives, the applicant proposes to build upon the promising Montana Areas Potentials System (MAPS) which represents the state in 18,000 cells, each about eight square miles in area. Already coded within the system are 17 different maps of Montana land resource characteristics that can be recombined in thousands of ways to show land-use qualities, potentials, and hazards. Recombinations would be made in cooperation with agencies and individuals working on the transfer of land resource technology. MAPS would show generally where that technology is best applied in Montana. This project would cooperatively develop such products as wall maps and slides for group meetings, paper maps for reports and newspaper publications, and video image maps.

TECHNICAL FEASIBILITY ASSESSMENT

Needs and opportunities for computer-assisted technology transfer increase yearly. Potential impacts of exotic weeds, insects, plant diseases, and toxic substances are partly determined by the environment in which they are introduced; there are increasing numbers of such introductions. Successful reclamation, conservation tillage, plant breeding, fertilizer use, on-sight waste disposal, forestry, and range management are achieved by matching appropriate technology to environmental characteristics of a site. As technological opportunities increase in number, more efficient means are needed for testing them at a few representative sites, and transferring the results to similar areas. The alternative is to repeat research at site after site or simply proceed by costly trial and error.

The project, by design, would have to be broad-based and with limited detail. Therefore, use would be of a general nature. It is assumed, however, that as future technologies are developed the detail could become much greater, which would expand the usability of the system.

FINANCIAL ANALYSIS

Total Project Cost		$63,992
Funding Source	Amount	
1. Legacy	$63,992	
Total Funding Contributions		$63,992

The budget appears to be adequate to do the job as outlined and is not inflated. Consideration could have been given to the use of two technicians instead of one, which would increase the project budget, but the two sets of ideas could result in a better system.

Financial support for this project to this point has been gained from the Montana Agricultural Experiment Station and the Montana Wheat Research and Marketing Committee.

ENVIRONMENTAL IMPACT ASSESSMENT

The project itself does not have any environmental impacts. However, the results from the project could determine areas of environmental problems or areas requiring similar treatments to environmental problems.

PUBLIC BENEFITS ASSESSMENT

Widespread benefits would occur by making resource and research data available quickly and efficiently. However, the degree of detail would limit the benefits.

RECOMMENDATION

Recognizing limited need and limited usability of the product, no funding is recommended for this project.

APPLICANT NAME: Montana State University, Plant and Soil Science Department

PROJECT/ACTIVITY: A Program to Eradicate Dyers' Woad In Montana

GRANT AMOUNT REQUESTED: $32,856

TOTAL PROJECT COST: $47,356

PROJECT DESCRIPTION

Dyers' woad, a native of southeastern Russia, was grown as a source of indigotine (a blue dye) in China, Europe, and North Africa. It was imported into Virginia as a cultivated plant during colonial times, and was taken ultimately to Utah. It has the potential to become as troublesome as spotted knapweed or leafy spurge.

Dyers' woad is highly competitive. In Utah it thrives from valley bottoms to sub-alpine regions, on rangelands, in grain, and in alfalfa fields. Germination and growth of other plants are suppressed by a chemical substance contained in the seedpods of Dyers' woad. Woad plants use twice as much nitrogren and phosphorus, and four times as much potassium and water as an oat plant. It first invaded Montana about 30 years ago. Fortunately, Dyers' woad is easily recognized.

Dyers' woad has been collected at six locations in the state: 50 miles south of Dillon, in southern Silver Bow County, ten miles east of Livingston, at the foot of Mount Sentinel in Missoula County, west of Roundup, and 16 miles north of Geyser in the Highwood Mountains. The Dillon infestation is the largest in acreage.

Dyers' woad is a noxious weed that can be eliminated from Montana if action is taken now. Plants in small patches can be pulled or grubbed for several years until the source of viable seeds is eliminated. Dyers' woad is readily controlled by herbicides. While the best treatment is an application of 2,4-D + dicamba, 2,4-D alone is also effective if it is applied when the plants are in the rosette state.

Montana State University (MSU) proposes to develop a two-phased program for eliminating Dyers' woad from Montana. The first phase would be an education program to help locate all known infestations of the plant, and the second phase would be a control program to eradicate the weed.

TECHNICAL FEASIBILITY ASSESSMENT

A graduate student would be hired for two years to implement the program. The student's responsibilities would include preventing seed production by Dyers' woad at all known infestations in Montana. The student would block production by spraying, hand-pulling or clipping. All new infestations would be identified and mapped. A bulletin and posters about the biology and control of Dyers' woad would be produced and distributed throughout the state. Other educational methodologies would also be carried out. Further research about the plant would be conducted. The suggested alternatives appear feasible and appropriate. The need for this proposal has been established.

FINANCIAL ANALYSIS

Total Project Cost		$47,356
Funding Sources	Amount	
1. Legacy	$32,856	
2. Applicant	14,500	
Total Funding Contributions		$47,356

Salary, benefits, and labor costs would be $17,380. Travel expenses would total $8,000 and pickup truck costs would be $6,000. Printing and secretarial charges would amount to $5,400. Chemical and spraying costs would be $5,100. Indirect costs to MSU would be $5,476. Cost estimates appear reasonable and adequate, although pickup truck costs could be reduced by leasing the vehicle.

Other funding sources have not been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse impacts are anticipated from this project assuming that proper herbicide application procedures are followed. Long-term positive impacts may result if the Dyers' woad infestation is eliminated from Montana before it becomes a serious problem to Montana's agricultural and wildlife resources.

PUBLIC BENEFITS ASSESSMENT

This proposal would protect the state's renewable resources through control of the noxious weed Dyers' woad. All Montanans would benefit if this weed is eradicated from the state before it becomes a serious threat to Montana's natural resources.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Roosevelt County Rural Water District

PROJECT/ACTIVITY: Roosevelt County Rural Water System

GRANT AMOUNT REQUESTED: $1,120,000

TOTAL PROJECT COST: $2,219,125

PROJECT DESCRIPTION

The Roosevelt County Rural Water District was formed in 1982 to plan and construct a rural water system serving 12 townships in eastern Roosevelt County. The proposed system would supply 180 farmers and ranchers with domestic and stock water, as well as provide municipal water for the communities of Froid and Fort Kip. The applicant has requested legacy program grant funds to cover a portion of the design and construction costs of the rural water system.

Approximately 30 percent of the rural area residents currently haul water. The remainder use wells (30-300 feet deep) that generally supply poor quality water. Water quality problems include hardness, iron, sulfates, and dissolved solids. One well, which serves 30 families, was found to contain selenium (a toxic material) in levels that exceed federal safe drinking water standards. Water shortages are also a problem. The Town of Froid has had to ration water and many rural wells run dry frequently.

The proposed central distribution system would consist of PVC pipe and would carry water from Culbertson's water treatment system to the district members. An underground reservoir with booster pumps and in-line boosters to supply pressure and demand is also proposed.

TECHNICAL FEASIBILITY ASSESSMENT

Preliminary designs and layouts for the proposed system were developed for the applicant. Trickle-flow systems are often the design chosen for projects of this type; however, in this case, the engineers recommended a pressure system capable of full-peak period service. This recommendation was made after preparing preliminary designs and cost estimates for both types of systems. The water system would receive its supply from the Missouri River through Culbertson's new water treatment facility. Culbertson is proceeding with this project under partial Water Development Program financing.

An initial project plan was prepared by the Old West Rural Water Office in 1980. The project planning has progressed under the direction of a steering committee and the water district board, with assistance from the County Extension Service and the Roosevelt County Planning Board. Area water problems have been documented with water quality sample analysis and a survey that allowed all residents to assess the quantity and quality of their individual water supplies. The need for a rural water system was established by collection of a $100 good intention fee from each of 185 potential water users. The current preliminary engineering report and cost estimate was prepared by an engineering consultant in August of 1984. The proposed project plan is appropriate, and if constructed, would provide a long-term supply of high quality water to the area. The project design and construction could be completed in two years after complete financing has been arranged.

FINANCIAL ANALYSIS

Total Project Costs		$2,219,125
Funding Sources	Amount	
1. Legacy	$1,120,000	
2. Applicant	2,219,125 (maximum loan recommended)	
Total Funding Contributions		$2,219,125

A $2,219,125 loan from coal severance tax bond proceeds has been recommended by DNRC for approval by the 1985 Legislature. The loan would have a 20-year term and would carry an interest rate three percentage points below the bond rate for seven years, followed by an interest rate equal to the bond rate for the final 13 years of the loan. Under the above terms, a $1,120,000 legacy program grant with a $1,099,125 loan, would result in an average monthly water user rate of $80 to $90 per month. Construction of the project without grant funds and a $2,219,125 loan, would result, under the above terms, in an average monthly water user rate of $125 to $140 per month. The state-wide average monthly water user rate for rural water systems is about $85 per month.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would include many miles of ditch excavation for the water system pipeline. Construction activities are expected to result in short-term erosion problems and loss of vegetation. Much of the construction would parallel existing roads and public rights-of-way. Final impacts should be

addressed in the design and permitting phase. There are no expected long-term negative impacts. Following construction, complete reclamation would be required to correct land disturbance.

PUBLIC BENEFITS ASSESSMENT

The residents of Froid, Fort Kip, and a 120-square-mile rural area would benefit from this project. Primary project benefits include: adding and improving domestic and agricultural water supply, preventing disease, preventing property damage, and providing new business opportunities.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Roosevelt County Weed District

PROJECT/ACTIVITY: Coordinated Leafy Spurge Control Project

GRANT AMOUNT REQUESTED: $ 66,000

TOTAL PROJECT COST: $116,000

PROJECT DESCRIPTION

Noxious weeds infest about nine percent of the land in Roosevelt County. While current control methods have been effective in checking the spread of knapweed, field bindweed, horay cress, dalmation toadflax, and Canada thistle, the spread of leafy spurge has doubled in size since 1967. Leafy spurge now infests an estimated 30,000 acres of rangeland. Control efforts along roadsides have been effective, but piecemeal control attempts by landowners have not.

The Roosevelt County Weed District proposes to coordinate and provide assistance to area farmers and ranchers in controlling leafy spurge in the Shotgun and Snake Creek drainages, which originate in Roosevelt County. These drainages affect the Missouri River, Big Muddy Creek, Medicine Lake, and Sheep Creek. The proposed control area covers 23,600 acres. The project would last seven years with legacy, county, and private funds providing control the first three years, and the county providing funding for the remaining four years.

TECHNICAL FEASIBILITY ASSESSMENT

The Roosevelt County Weed District would coordinate the project. Legacy funds would provide a 50 percent cost-share for chemicals to landowners. Landowners now receive only one-third cost-share from the county. The county would hire a weed supervisor to oversee the project. The supervisor's duties would include meeting with property owners to coordinate control methods, herbicide purchases, herbicide applications, and follow-up monitoring.

The Bureau of Land Management, Bureau of Indian Affairs, Montana Highway Department, and Burlington Northern are either now participating in control methods or are willing to participate.

Some sheep-grazing efforts of control, and biological control efforts using the hawkmoth and oberea beetle would also be used. Mechanical control measures would be used where chemicals could not be used. Water quality monitoring would be conducted to assess impacts from chemicals. Chemicals should not be used in areas where impacts are questionable. A weed inventory has been conducted.

The project is planned for seven years to include follow-up assessment of control efforts. Legacy funds would be used for two years of control. Most of the effort using the legacy funds would take place during the 1986-87 biennium.

FINANCIAL ANALYSIS

Total Project Costs		$116,000
Funding Sources	Amount	
1. Legacy	$66,000	
2. Applicant	30,000	
3. Private Landowners	20,000	
Total Funding Contributions		$116,000

Chemicals (mostly Tordon) for the weed control project are estimated to cost $75,000. Cost for spray equipment purchase and rental would be $24,800. Inflation and contingency would add $16,000 to the total project cost. Two hundred dollars would be provided for water quality testing. The $66,000 legacy contribution will be 50 percent of all equipment, monitoring, and chemical costs, and all of the inflation and contingency costs.

Monitoring cost estimates are unrealistically low compared to the monitoring frequency described. Other estimates appear adequate.

ENVIRONMENTAL IMPACT ASSESSMENT

Uncontrolled infestations of leafy spurge can adversely affect the environment through loss of native vegetation, resulting in erosion, stream sedimentation, loss of fish and wildlife habitat, and loss of forage and agricultural crop land. Adverse environmental impacts could also result from the improper use of Tordon. If Tordon label instructions are specifically followed, and only licensed applicators apply the chemical, the adverse environmental impact from this project should be minimal. Consequently, the longer-term environmental impacts could be positive, by controlling the spread of the leafy spurge infestation. These positive effects, however, would last only as long as the control methods are continued or the leafy spurge infestations eliminated.

PUBLIC BENEFITS ASSESSMENT

The proposal would protect the state's renewable resources through control of leafy spurge. Primary benefactors would be the landowners in the project area. Other Montana citizens would benefit by the reduction of leafy spurge infestations in Montana.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Sheridan County

PROJECT/ACTIVITY: Coalridge-Dagmar South Paving Project

GRANT AMOUNT REQUESTED: $1,733,300

TOTAL PROJECT COST: $2,083,300

PROJECT DESCRIPTION

Sheridan County proposes to pave 15 miles of county road from the community of Coalridge to south of Dagmar. This road is the primary north-south route that has served the oil industry in the area for 20 years and also serves the most densely populated rural area of Sheridan County. Continuous heavy industrial traffic has caused the roadway to deteriorate faster than it can be maintained and repaired.

Properly designed, this project would create an all-weather, paved road to serve the increasing rural residents' use and the continuing concentration of oil industry traffic. The proposed improvements would reduce equipment replacement and maintenance costs for the industrial users and rural residents alike, and increase the safety of traffic for all those who use the road.

The road improvements are planned in two phases to be completed over a period of two years. During the 1985 construction season, the roadbed would be prepared. The surface would be paved the following summer, in 1986.

TECHNICAL FEASIBILITY ASSESSMENT

Planning for the project must address proper design of widths, alignment, foundation and safety considerations, and minimum design standards. The proposed construction would begin with roadbed preparation in 1985, regrading curves, elevating sections of roadbed, and leveling grades through hills and coulees. During the same construction season, a base of pit-run gravel would be applied followed by a mat of crushed gravel. Pavement would be applied the following summer (1986), allowing time for the reconstructed areas to settle, and to work out roadbed imperfections.

Previous work has been done on this section of road during the last two years, including installation of a concrete bridge, leveling of a road grade and modification of a curve. Without legacy program grant funding, Sheridan County will proceed slowly with road upgrading work as funds become available.

This project has not been coordinated with other public agencies at this time. With grant funding, this project could be completed in the upcoming biennium.

FINANCIAL ANALYSIS

Total Project Cost		$2,083,300
Funding Sources	Amount	
1. Legacy	$1,733,300	
2. Applicant	350,000	
Total Funding Contributions		$2,083,300

Sheridan County would make $100,000 available for this project in 1985 and $250,000 in 1986. Preliminary cost estimates for the project appear reasonable and accurate. A more detailed budget should be developed as project design work continues. No other sources of funding for this project are known at this time.

ENVIRONMENTAL IMPACT ASSESSMENT

Long-term impacts of this project should not be a problem. Short-term impacts would include dust, construction traffic, and noise. After completion, positive impacts would be less dust from traffic and lowered maintenance costs.

PUBLIC BENEFITS ASSESSMENT

The general public, rural residents, tax-payers, and industrial users would all benefit from this project with improved access to communities, agricultural markets, and industrial sites, reduced equipment maintenance costs, decreased noise and dust pollution, and improved safety features.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Sheridan County (for Reserve Sewer District)

PROJECT/ACTIVITY NAME: Sewer System for Community of Reserve

GRANT AMOUNT REQUESTED: $104,718

TOTAL PROJECT COST: $404,700

PROJECT DESCRIPTION

The unincorporated community of Reserve, located in Sheridan County, has no central sewage collection system or sewage treatment facilities; residents provide their own sewage disposal facilities. Because soils in the area are essentially unsuitable for conventional drainfield systems, most residents simply provide a septic tank that overflows directly to either Big Muddy Creek

or one of the small collector systems that discharges to Big Muddy Creek. There are presently 39 residences in Reserve; the estimated total population is about 80 people.

Because of the water pollution effects and health risks caused by the inadequate and unacceptable sewage disposal methods used by residents of the community of Reserve, the community has been ordered by the Environmental Protection Agency (EPA) and the State Department of Health and Environmental Sciences (DHES), Water Quality Bureau (WQB) to install an adequate sewage collection, treatment, and disposal system. EPA and Sheridan County have funded an EPA Facilities Plan, which is a comprehensive preliminary engineering study completed in the fall of 1984. It is proposed to create a public agency called Reserve Sewer District to administer the upgrading project and operate and maintain the completed facilities.

This project consists of design and construction of a complete sewage collection system and disposal facilities. The system would collect septic tank effluent in small-diameter pipe and pump the collected septic tank effluent to a properly designed and located community subsurface soil absorption system. The selected alternative is as follows: 4,350 feet of 6-inch gravity sewer line, 2,000 feet of 4-inch sewer service line, 12 manholes, 21 septic tanks, lift station and 3,100 feet of 4-inch force main, and a "Wisconsin Mound" type, raised-bed drainfield.

TECHNICAL FEASIBILITY ASSESSMENT

In the required plan several appropriate alternative solutions to Reserve's sewage treatment problems were studied and the most cost-effective solution was selected. It is a technically feasible alternative and would solve Reserve's present sewage disposal problems.

The facilities plan and design of all improvements would be reviewed and approved by WQB before construction begins. WQB supports and concurs with the need for the project.

FINANCIAL ANALYSIS

The total cost of the project is estimated at $404,700, of which $326,210 would be the cost of construction and contingencies and the balance would be engineering, administration, financing, and legal costs. The facilities plan cost an estimated $15,000 and was funded by the EPA and Sheridan County. The total project cost would not include the cost of the facilities plan. The application is for a grant of $104,718. A grant of $254,025 is expected from EPA. The balance of project costs would be financed by the District. The applicant also applied to DNRC for Water Development loan and grant funds, and a grant of $33,000 and a loan of $117,000 was recommended by DNRC to the legislature for the project. If the legislature approves the recommended funding program, the project funding would be as shown on the following chart.

Total Project Cost		$404,700
Funding Sources	Amount	
1. Legacy	$104,718 (grant)	
2. WD Program	33,000 (grant)	
3. EPA	254,025 (grant)	
4. Applicant	12,957 (loan)	
Total Funding Contributions		$404,700

The district to be formed would be able to issue revenue bonds, upon approval of the voters within the district. Such bonds would be used to cover the applicant share of project costs. The estimated costs appear realistic and reasonable and the chosen solution would be the most cost-effective alternative.

ENVIRONMENTAL IMPACT ASSESSMENT

No significant adverse environmental impacts are anticipated with this project. Only the unavoidable, short-term impacts typically associated with similar municipal utility construction projects are expected. This project should enhance the environment by eliminating the serious public health hazard and water pollution problem created by failed individual sewage disposal systems.

PUBLIC BENEFITS ASSESSMENT

Until the oil boom during the late 1970s, Reserve had a declining population; its major businesses and school had closed, and it appeared that the town would soon become a ghost town like many other small rural communities in the area. With the oil boom, all of the vacant houses and many vacant lots became occupied, primarily due to a housing shortage in Plentywood and other towns with more adequate services. Lots and rental units were available at very reasonable prices and attracted many who could not find affordable housing elsewhere. Although the oil boom peaked in 1981 and oil development and economic activity have returned to moderate levels, there has been no reduction in the town's population or the economic activity associated with oil development. The continued expansion of the Reserve Pipeline Terminal and the discovery and continuing development of two new oil fields--all within a mile of Reserve--have contributed strongly to the town's continued existence and the employment of many of its residents.

Sheridan County is seeking legacy funding for Reserve's proposed sewer system primarily because of the uncertainty regarding continued oil development. The problem in developing a sewer system in Reserve is that the town would incur substantial debt in constructing the system and there are no assurances that the oil economy or the town's residents would be there ten or twenty years from now when they would still be paying for the system. The development of a sewer system in Reserve could in itself provide a catalyst for the town's demise. The economic burden of debt repayment along with system operation and maintenance (O&M) costs, could make it more economical

for some residents to move elsewhere. The loss of even a few residents would shift additional debt and O&M costs to the remaining residents, increasing their costs. At some point the shift in debt burden could become great enough to force established residents to move away from the high costs.

The problems in Reserve's existing sewage situation originated before oil development; however, if it were not for the oil development impacts the problem would not be as severe in terms of the amounts of effluent generated. The need for remedy would not need to be as extensive or costly.

Because Reserve's sewage disposal problems relate to oil and gas exploration and extraction, this proposal seeks to provide mitigation of social and economic impacts of oil and gas development. The improved sewage disposal system for Reserve and the elimination of an existing public health hazard and water pollution problem in Big Muddy Creek would compensate for the impacts of oil and gas exploration and development. Primary benefactors would be the residents of Reserve.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Tiber County Water District

PROJECT/ACTIVITY: Training and Technical Assistance Advisor

GRANT AMOUNT REQUESTED: $100,000

TOTAL PROJECT COST: $100,000

PROJECT DESCRIPTION

The Tiber County Water District plans to contract with Montana Rural Water Systems, Inc. to provide technical assistance services state-wide. Montana Rural Water Systems, Inc. is a private, nonprofit corporation that provides technical assistance through on-site visits and workshops to 400 members in water and energy conservation techniques, water system operation and maintenance, record keeping, and rate structures. The circuit riders employed by the organization primarily serve operators of established rural water systems in the western part of the state. The organization claims good success in implementing cost savings and water conservation techniques through its assistance program. The program is serving nearly half the rural systems in the state and has had considerable demand for its services. The proposal would provide an additional circuit rider and help fund the workshop program.

TECHNICAL FEASIBILITY ASSESSMENT

Most of the small rural water systems in the state cannot afford highly trained operators. Many of these systems are old, require constant maintenance, and often have contamination problems. A combined circuit rider and workshop approach is an efficient way to address the public health and operation and maintenance problems prevalent in the state's small rural water systems.

FINANCIAL ANALYSIS

Total Project Costs		$100,000
Funding Sources	Amount	
1. Legacy	$100,000	
Total Funding Contributions		$100,000

The $100,000 budget for the project anticipates an annual cost of $50,000. This annual budget includes $41,820 for the circuit rider, secretarial support, travel, telephone, and postage expenses. Of this, $5,200 is allocated annually for support services for the corporation and $2,980 for training equipment and materials.

ENVIRONMENTAL IMPACT ASSESSMENT

The project would have long-term positive effects on the environment through water and energy conservation and improved water quality.

PUBLIC BENEFITS ASSESSMENT

The project would provide better quality water supply for rural water systems and could help reduce water use, thereby reducing user fees.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: University of Montana, Chemistry Department

PROJECT/ACTIVITY: Tested Bagged Knapweed Silage as a Winter Feed for Cattle

GRANT AMOUNT REQUESTED: $62,960

TOTAL PROJECT COST: $62,960

PROJECT DESCRIPTION

Knapweed was first reported in western Montana during the mid-1920s. It probably came from Europe as a seed contaminant of hay or alfalfa seeds, free of natural diseases and insect herbivores. Producing large quantities of seed that was readily transported by humans and their vehicles, the plants spread rapidly through normal biological methods. In a 60-year period, knapweed has invaded all 56 counties in the state. Thriving on disturbed native rangelands, these plants occupy an estimated two million acres and have the potential for infesting an additional 32 million acres. Knapweed replaces the more desired forage plants and has minimal forage value for cattle, horses, and probably most wildlife. If knapweed invaded all susceptible sites in Montana, annual losses from grazing livestock could reach $156 million per year. This does not include losses of wildlife or decreased land values.

Currently the most effective control for knapweed is the herbicide, Tordon 22K. Disadvantages include high costs; persistence in the soil; toxicity for trees, shrubs, forbs, and cultivated crops; and restrictions in its use, especially adjacent to water. Cultural practices such as mowing, burning, planting, and good range management can help retard knapweed's spread, but will not eliminate those stands already well established. One possible method of control is to import natural enemies from Europe. Scientists at the Agricultural Research Center near Corvallis have been evaluating and releasing biological control agents. The full benefits of biological control from insects and disease are many years away. In the interim, knapweed infestations are expanding and population densities increasing. Some knapweed populations may be controlled by grazing sheep. One major disadvantage of sheep is that they require close supervision and management, limiting their use on open range and public lands.

Because knapweed has built up a high-density population in the western counties, complete eradication would be impossible. The degree of control administered would be guided by monetary factors. Knapweed would be completely eliminated from those lands where it cannot be tolerated, whereas on other sites, populations would only be reduced to acceptable levels. In some instances, "acceptable" may mean no control at all. Using the plants for whatever value they might have could help minimize economic losses from current infestations until better control measures can be developed.

A study conducted in 1984 demonstrated that knapweed has a nutrient composition equivalent to alfalfa hay. Cutting plants from the high productivity site and sealing them in air-tight plastic bags provided a sweet-smelling silage with an excellent nutrient content and physical appearance. The University of Montana proposes to prepare sufficent bagged knapweed silage to feed six head of cattle through the winter (approximately November through May). They would compare the cattle (weight and general health) with a control group of six animals fed with hay. The project would occur on a small ranch in western Montana.

TECHNICAL FEASIBILITY ASSESSMENT

A rancher in the Missoula Valley is willing to rent pasture space for livestock and storage of feed. With the help of the county extension agent, a field or fields with sufficient knapweed to produce 50 tons of knapweed silage would be located. During the first week of July, 50 tons of knapweed would be cut and sealed in large plastic silobags for fermentation. This job would be contracted to one of several ranchers in the Ronan, Polson, or Kalispell area with all the equipment necessary to prepare bagged silage.

The silage would need about three weeks to ferment. In August, after fermentation has been completed, the silage would be sampled and analyzed for nutrient composition: protein, fiber, ether extractives, total nonstructural carbohydrates, ash, and cnicin content. In September and October, the ranch facilities would be prepared and hay and grain would be purchased. In November, twelve head of livestock would be purchased. Care would be taken to select animals of similar age, breeding, and size. Placement into treatment and control groups would be assigned randomly. All animals would be tagged, weighed, and examined by a veterinarian before feeding begins. From November through May, the control group would be fed hay and the treatment group would be fed silage. Two interim visits would be made by a veterinarian. In May, feeding would be completed, final weights taken, and a final veterinarian visit made. The veterinarian would kill one silage-fed animal and perform an

autopsy to look for any internal abnormalities that may have developed. In June, the animals would be sold at their fair market value back to the ranch owner or at market. The funds would be added back to the project account.

A final report describing the results would be prepared for publication in an appropriate journal such as Rangelands. The sponsor would attend local and regional weed meetings, or have meetings with interested individuals, to discuss the findings.

Reviewers support this innovative approach. The scientific methods proposed are acceptable.

FINANCIAL ANALYSIS

Total Project Cost		$62,960
Funding Sources	Amount	
1. Legacy	$62,960	
2. Applicant	-0-	
Total Funding Contributions		$62,960

Salaries and benefits total $26,350 and travel costs would be $2,570. The cost for project livestock would be $6,600. Feed, pasture and storage rental, miscellaneous supplies, and veterinarian services would be $13,811. Indirect costs and inflation would add $13,629 to the project cost.

Project costs appear reasonable and adequate. The cost would be reduced, after the livestock is sold, by approximately $6,600. No other funding sources have been identified.

ENVIRONMENTAL IMPACT ASSESSMENT

No adverse environmental impacts would result from this project. Rather, positive impacts may result through the use and reduction of the concentration of knapweed in western Montana.

PUBLIC BENEFITS ASSESSMENT

The proposal would protect the state's renewable resources through weed control, and would provide for research and demonstration to promote the wise use of Montana's natural resources.

The outcome of this project, if successful, would be a method of processing spotted knapweed to produce silage (a revenue-generating product) that could be used as a winter feed for cattle. The individuals benefiting from this knowledge would be ranchers who could use the silage as feed, landowners--plagued with knapweed infestations--who could sell the plants for silage, and both state and county governments who would receive higher tax revenues from the improved agricultural productivity. Cropping would also reduce knapweed seed sources, which will benefit all Montanans.

RECOMMENDATION

No funding is recommended for this project; however, the application will be forwarded to the Montana Department of Agriculture for consideration under its funding program.

APPLICANT NAME: Whitefish County Water and Sewer District

PROJECT/ACTIVITY: Whitefish Critical Area Identification and Preliminary Engineering

GRANT AMOUNT REQUESTED: $224,310

TOTAL PROJECT COST: $246,725

PROJECT DESCRIPTION

The Whitefish County Water and Sewer District was established as a public entity in 1982 to address the water quality problems in the Whitefish Basin and especially in Whitefish Lake, which is the water supply for the Town of Whitefish and lakeshore residents. The district includes about 39,000 acres around the lake and serves an estimated population of 2,200. In 1981, dye tests revealed that septic tank effluent was entering Whitefish Lake from sites along the east shore; septic tank failures were confirmed by the county sanitarian within a larger area around the lake. Area residents formed the Whitefish Basin Project to respond to these problems and subsequently the district was formed to provide the legal framework to develop and implement comprehensive long-term solutions to the problem. Also in 1982 the Flathead County Commissioners allocated $32,500 for a limnology study of the Lake. The results of the limnology study, released in early 1984, confirmed that the lake demonstrates a trend toward premature eutrophication, and that continuing input of phosphorus will result in rapid deterioration of the lake's water quality. In 1983 the district was awarded a $100,000 grant by the Department of Natural Resources and Conservation (DNRC) from the Water Development Program to complete a resource inventory and management plan for the district. This grant and money from Flathead County funded a follow-up study to detect the location and severity of septic leachate along the east and south shores of the lake. This year-long study will document leachate sources identified with seasonal uses. A second phase of the leachate study would determine the individual sources of leachate, using resistivity and dye tests. Funding from the legacy program is proposed for Phase II of the leachate study as well as a study of treatment alternatives for these critical areas to identify areas that can be served by sewer through the Whitefish facility and areas suitable for other treatment alternatives such as small sewage treatment plants. The study of treatment alternatives would include preliminary level design work. A ground water study is proposed for the area to identify recharge and discharge areas, ground water quality, and depth and direction of flow. Areas of contaminated ground water and areas particularly sensitive to contamination would be identified. The district expects the Montana Bureau of Mines and Geology (MBMG) to conduct the ground water study and the Bureau has indicated that matching money may be available. The critical area study and the ground water study would be incorporated in the Water Management Plan and form the basis for an EPA Construction Grant application and development guidance recommendations by the district. In addition to MBMG, the district plans to hire consultants to complete the leachate analysis and treatment feasibility work for the critical area study. The proposal also provides for the continuation of the district manager function to coordinate special studies, continue a public education program, and prepare implementation recommendations for the Water Management Plan.

TECHNICAL FEASIBILITY ASSESSMENT

The district proposes to use dye tests and resistivity to identify the septic systems responsible for the leachate in the lake. MBMG, an acknowledged authority in ground water analysis, would be expected to carry out the ground water study. MBMG has prepared a thorough study plan for the district. The opportunity to coordinate surface and ground water studies for the area is considered advantageous for both studies and would enable the district to develop both water supply and sewage treatment recommendations for the area. This approach addresses the most critical problems revealed in the district's work thus far and demonstrates a logical progression in their management program. The two-year study should yield mapping for the critical areas polluting Whitefish Lake and engineering work sufficient to document the construction grant application.

FINANCIAL ANALYSIS

Total Project Cost		$246,725
Funding Sources	Amount	
1. Legacy	$224,310	
2. Montana Bureau of Mines & Geology	22,415	
Total Funding Contributions		$246,725

The district is requesting a grant of $224,310 for the program, which would cost a total of $246,725. It is anticipated that MBMG would contribute $22,415 for the ground water study. The program budget includes administrative costs and the salary of the District Manager. Cost estimates for the engineer, hydrologist, and limnologist for the study components are documented. The budget varies from that submitted for funding from the Water Development Program. The hydrology study costs have increased by about $3,000 and the leachate study has decreased by $26,000 to indicate the portion of the study recently funded with a revenue sharing award from the county. The inflation and contingency amounts have been adjusted accordingly. Although the program provides for an integrated approach to the district's major problem, any of the components could be funded separately and be a worthwhile contribution to the district's efforts.

ENVIRONMENTAL IMPACT ASSESSMENT

The limnology study recently completed for Whitefish Lake documents rapid deterioration of the lake. If the problem is not addressed, the quality of the water in the lake may pose a health hazard throughout the area and contribute to a deterioration of all aspects of the environment dependent on a safe and healthful water supply.

PUBLIC BENEFITS ASSESSMENT

The most critical public benefit of the program is preserving a safe water supply for the Town of Whitefish and lakeshore residents. The program would provide a similar benefit for all downstream water users, including residents of the Flathead Lake area. The program would also preserve one of the most important recreational areas in the state and the fishery and wildlife habitat of the area.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Yellowstone County

PROJECT/ACTIVITY: Critical Lands Inventory

GRANT AMOUNT REQUESTED: $17,400

TOTAL PROJECT COST: $23,200

PROJECT DESCRIPTION

Yellowstone County is establishing a county planning board having jurisdiction county-wide except for Laurel. The initial work program will include a County Comprehensive Plan. The county proposes a critical land inventory as one part of the plan. To document need, the application cites a state-wide, five-year review of land subdivision by the Environmental Quality Council which found that Yellowstone County ranks fourth in the state in the amount of land subdivided. The inventory is intended to help the planning program promote the wise use or non-use of land and reduce environmental conflicts resulting from suburban growth. It will be used to guide the subdivision review process, serve as a basis for the establishment of special natural resource protection areas, guide a land acquisition program, and encourage good land development design through increased awareness of critical areas. The proposal includes developing critical area criteria, an inventory of such lands, and preparation of a map illustrating the inventory findings. The county has numerous old gravel pits to be included in the inventory so that a reclamation program can be developed.

TECHNICAL FEASIBILITY ASSESSMENT

The critical land criteria and mapping are intended in part as the legal support for development standards and restrictions. The proposal anticipates that the criteria and mapping would be adopted following the public hearing and review process. The mapping would be designed to make the inventory data available for developers and decision makers in a useful format. The proposal states that a consultant would carry out the project. In order to assure a useful product, technical reviewers of the proposal suggested that the planning staff be closely involved in developing the critical area criteria. Use of data and criteria information from other public agencies was also

suggested. The activities proposed are all standard planning activities. There should be no difficulty in developing the procedures and a plan to carry out the work. The project should take seven months.

FINANCIAL ANALYSIS

Total Project Costs		$23,200
Funding Sources	Amount	
1. Legacy	$17,400	
2. Applicant	5,800	
Total Funding Contributions		$23,200

The legacy proposal includes $17,000 for consultant services, and $3,000 in administrative costs which would be contributed by the county. The remaining $3,200 allows for contingency and inflation costs. Cost estimates for the work appear reasonable, but using available data may reduce the criteria development cost and allow more funds for the inventory and mapping.

ENVIRONMENTAL IMPACT ASSESSMENT

The critical land data, if incorporated with the subdivision review process and other land management programs, could have a substantially beneficial effect on the Yellowstone County natural environment.

PUBLIC BENEFITS ASSESSMENT

The public could benefit if the land management program carries out the protection of the soil and water resources of the area. Costly public services are often required after development in fragile areas and this program could prevent those costs from occurring.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME: Yellowstone County

PROJECT/ACTIVITY: Homestead-Oxbow Area Water System

GRANT AMOUNT REQUESTED: $ 550,000

TOTAL PROJECT COST: $1,100,000

PROJECT DESCRIPTION

The Homestead-Oxbow Area contains several subdivisions that have developed over the years immediately to the northeast of Billings Heights. Originally, homeowners in the area were able to develop their own wells and many domestic wells produced as much as 50 gallons per minute (gpm). However, as the area developed, more wells were developed, and the yields in many area wells dropped to as low as two gpm. Faced with inadequate water supplies, many residents have resorted to hauling water to individual cisterns. Fire protection is essentially nonexistent in the area. The Homestead-Oxbow Area has for years wanted to be provided water by the Billings Heights Water District (District). However, only since completion of its two-million-gallon Lanier Reservoir in 1981 near the Homestead Subdivision has the District had the facilities necessary to extend service in the area. The District has agreed (subject to approval of the voters) to provide water service to the Homestead-Oxbow Area provided the area form an RSID, pay for its own improvements, and "buy-in" to the District. The "buy-in" fee will cover the District's cost of providing a booster pump station and 24-inch, 16-inch, and 12-inch transmission lines in the area. Yellowstone County has applied to DNRC for the residents of the Homestead-Oxbow Area and they are in the process of forming an RSID.

The project consists of designing and constructing the following improvements within the RSID: 6,665 feet of 8-inch line, 3,325 feet of 6-inch line, twelve 8-inch gate valves, five 6-inch gate valves, 28 fire hydrants, and miscellaneous appurtenances. The project also includes the cost of forming an RSID and "buy-in" to the District.

TECHNICAL FEASIBILITY ASSESSMENT

A preliminary engineering study was completed on the project. The study addressed alternatives, special problems, costs, financing options, and other issues in detail. The proposed alternative for solving the Homestead-Oxbow Area's domestic water problem appears to be appropriate and technically feasible.

FINANCIAL ANALYSIS

Total Project Costs		$1,100,000
Funding Sources	Amount	
1. Legacy	$550,000	
2. Applicant	550,000	
Total Funding Contributions		$1,100,000

The budget includes $103,700 in RSID formation and other administrative costs, $65,130 in professional/technical costs, $472,726 in "buy-in" costs, $301,812 in construction costs, and $155,803 for contingencies. The applicant intends to use a loan from the coal severance tax bond program to finance its share of the project.

ENVIRONMENTAL IMPACT ASSESSMENT

No significant short- or long-term environmental impacts are anticipated from this project.

PUBLIC BENEFITS ASSESSMENT

The project would protect the limited ground water resource in the Homestead-Oxbow Area by using Yellowstone River water, via the Billings Heights Water District, instead. Homestead-Oxbow homeowners and landowners would benefit from the project.

RECOMMENDATION

No funding is recommended for this project.

APPENDIX A

MONTANA LEGACY ADVISORY COUNCIL

The Montana Legacy Program Advisory Council was appointed by Governor Schwinden in 1984 to review legacy applications and assist in developing recommendations to the governor. Members have contributed a great deal of time and effort to the program, and the Department greatly appreciates their input. The names of the Montana Legacy Program Advisory Council follow.

Richard "Dick" Bennett, Chairman
Great Falls, Montana

Jim Spring, Vice Chairman
Billings, Montana

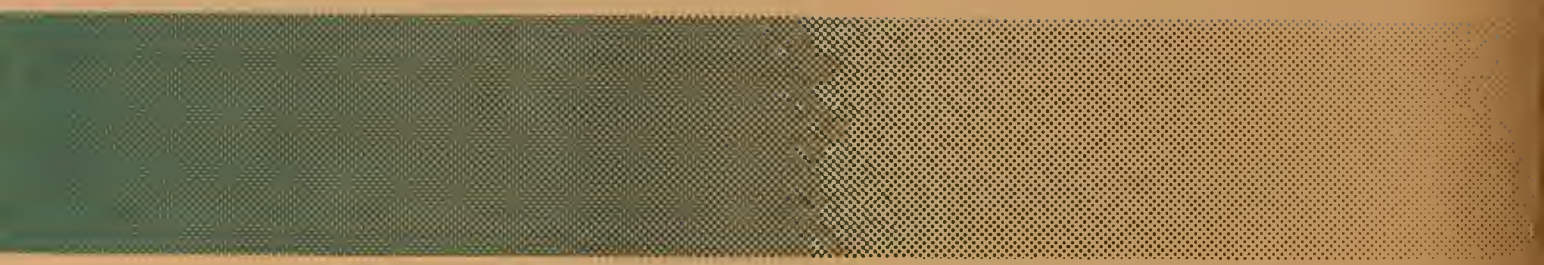
Ron Haffey
Anaconda, Montana

Paul Smith
Boulder, Montana

Thomas M. Battershell
Helena, Montana

Barbara Skelton
Stanford, Montana

Greg Jergeson
Chinook, Montana



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